

A REVISIONARY CLASSIFICATION OF THE  
RUTILIINI (DIPTERA : TACHINIDAE), WITH  
KEYS TO THE DESCRIBED SPECIES



BY  
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# A REVISIONARY CLASSIFICATION OF THE RUTILIINI (DIPTERA : TACHINIDAE), WITH KEYS TO THE DESCRIBED SPECIES

By R. W. CROSSKEY

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## SYNOPSIS

A comprehensive re-classification is proposed for the Rutiliini, a Tachinid tribe confined to the Oriental and Australasian Regions. Diagnoses and identification keys are provided for all genera and subgenera recognized, and all nominal species are appropriately placed in the classification after examination of the types. Keys are given, under their respective genus-group taxa, to almost all of the 121 described species that are recognized as valid; it is emphasized that the species keys are only tentative, as species limits are often uncertain and several undescribed species are known. The proposed classification is summarized and an index-catalogue is provided to all nominal species-group taxa and their primary types. One new genus, one new subgenus and seven new species are described; 47 specific names and 15 genus-group names are newly placed in synonymy; 29 lectotypes and 12 neotypes are newly designated; and one new name is proposed for a preoccupied secondary homonym. There are 26 new combinations (excluding those implied by new synonymy).

## INTRODUCTION

THE Rutiliini include the largest and most handsome flies to be found in the Tachinidae, and the brilliant metallic colours and conspicuous patterns of many species make them outstandingly attractive insects. The group is not well known outside of Australia, where it pre-eminently occurs, and the glinting beauty of the metallic forms comes as something of a surprise to the non-specialist accustomed to think of the Tachinidae as just about the dullest of the Diptera.

Because of their showy colouring and flower-loving disposition the Rutiliines were among the first Diptera to be collected in Australia, and most of the expeditions of the late 18th and early 19th centuries that had touched at 'New Holland' (Australia), 'Van Diemen's Land' (Tasmania) or the islands of Melanesia brought back specimens that were described by the European naturalists. The most venerable surviving example is Fabricius' type of *Rutilia retusa* in the Banks collection in London which was described in 1775 and was probably collected on one of Captain Cook's voyages.

From the writings of the earliest workers on the group it is clear that they were much impressed by the wonderful 'new' flies coming from Australasia, and this is attested by the names—such as *imperialis*, *mirabilis*, *regalis*, *splendida*—they bestowed on them. Some of the first describers were not primarily dipterists, and the best early work on Rutiliini was produced by the coleopterist Guérin-Ménéville (1843). By 1850 the rather surprising number of 44 nominal species had been described, and a further 40 nominal species were named before the end of the 19th century (mainly by Macquart, Walker and Bigot)—many of the names referring to features of the colour and marking.

The Rutiliini are more difficult to classify satisfactorily than would be supposed from their obvious appearance, and the fact that the bright colours and bold patterns can be relatively easily described has had one definite disadvantage in the systematic history of the group: it has tempted later workers to think that they could recognize the species described by their predecessors on the basis of the descriptions, without recourse to the types. Often this was not so, and both generic and specific nomenclature have been much confounded by the misapplication of names. The Rutiliini has also had its share of 'splitters', notably Townsend and Enderlein, creating what Paramonov (1968 : 351) amusingly called their 'deluge' of new genera. The misidentifications and generic splitting, together with the fact that no previous comprehensive study of old types was possible, has long meant that the systematics of Rutiliini have been in a bad state—as Paramonov put it we are 'left with the task of solving the riddles'. He himself had made an excellent start on this task, and Paramonov's (1968) posthumously published paper dealing with the genera other than *Formosia* and *Rutilia* is the best work on Rutiliini that has up to now appeared—in a class vastly superior to the superficial splitter's nightmare produced by Enderlein (1936) as a 'Klassifikation der Rutiliinen', which Paramonov so rightly deplored. Paramonov did not live to complete his projected work, and there was therefore no revision up to now of *Formosia* s.l. and *Rutilia* s.l., which together constitute about 70% of the Rutiliini.

The present paper is an attempt at a new comprehensive classification of the whole tribe. The work on which it is based grew gradually and inevitably out of the much

simpler objective of preparing an up-to-date catalogue of the Australian Tachinidae, a task which sounded easy enough but soon proved to be impossible without a really thorough revision of the Rutiliini. This group forms a very dominant element in the Australian Tachinid fauna, including at present about a quarter of the known species, and a catalogue of this large group based only on the muddled literature would have been not only useless but positively misleading. A dependable catalogue had to be based on a study of all the types, especially those of the early authors whose nominal species had been neglected or misinterpreted, so that realistic generic assignments and at least the obvious synonymies in genus-group and species-group names could be worked out. But even to make a generic assignment of a nominal species presupposes some concept of the generic limits, and when trying to place species into genera it soon became obvious that none of the existing generic classifications (Townsend, 1938; Enderlein, 1936; Paramonov, 1968) could be used satisfactorily, although that of Paramonov was outstandingly superior to any other (in fact my own classification here presented is in close accord with that of Paramonov in the number and scope of recognized genera). In short, the only way in which the Rutiliini could be satisfactorily catalogued was by first preparing a full-scale revisionary classification of the whole tribe.

The classification proposed here is based on the 'old-fashioned' methods of orthodox taxonomy, but the Rutiliini is a group which might lend itself well to the computer techniques of numerical taxonomy. The use of mathematical methods was considered at one stage of the work but it was decided to abide by conventional methods for the time being, in the hope that later on an Australian student might take up the group and test it by mathematical methods on far more material than is currently available. Two of the main difficulties with classical taxonomy in the Rutiliini are those of ranking of segregates and delimitation of species. Broadly speaking it is easy enough with suites of characters taken in combination to define segregates within the tribe (or, looked at the other way, aggregates of species) but it is a very subjective matter whether these are ranked as species-groups or genus-group categories; I have not always been completely happy at the choice of rank, for it is difficult to 'balance' recognizable segregates, but I am convinced that the groupings I recognize are natural entities whatever rank they may be accorded. On what is a species I am less happy, as there are real difficulties in several genera and subgenera in determining specific limits (some entities that are apparently species have distinctive and constant male genitalia, for example, but others either show no genitalic differences or some baffling variation).

Two particular aspects of the work require comment, the examinations of old types and the male genitalia. I have been able to see very nearly all of the types of the early authors (Bigot, Erichson, Fabricius, Gerstaecker, Guérin-Ménéville, Macquart, Walker, Wiedemann), only very few of which are lost; the types of Donovan, Gray and Robineau-Desvoidy are all lost. Examinations of these old types have enabled many formerly enigmatic names to be placed, either as valid names or as synonyms (because of the difficulty in some groups of deciding on specific limits, synonyms have only been established if there is very perfect agreement of types), and have unmasked several misidentifications.

A particular study has been made of the male genitalia. Malloch (1929, 1936), Engel (1925) and Paramonov (1968) published a few figures of male terminalia, but made no systematic study of them. In the present work the male genitalia have been examined for the great majority of species in order to assess their usefulness in classification; the outcome has been to find that they have very limited use for supraspecific classification but in many groups provide valuable characters at specific level (for further detail see the section on taxonomic characters).

The larger museum collections of Rutiliini, especially those at Canberra and London, contain specimens of several species that are obviously undescribed. I have not attempted to place these in the keys to species, which have been drawn up to cover only those species already described (as the title of this work states), but I have here described seven new species and these are placed in the keys. The new species have been described here for definite purposes: either because they show characters that significantly extend the range of form or colour previously known in the taxa to which they belong, or because they extend the previously known geographical range of their genus or subgenus, or to clarify species-complexes in which there was no available name for one of the constituents. Other new species known in collections have not been described because there are no cogent reasons at present why they need be named.

I must advert in this Introduction to the classification, briefly referred to above, of that entomological Jack-of-all-trades, Günther Enderlein. The paper of Enderlein (1936) on the Rutiliini was, luckily, his only venture into the Australian Tachinidae, except for his description of *Microtropesa violacescens*. It contains the usual lavish erection of unnecessary Enderleinian genera, 16 new genera in all, of which only one is given any recognition in my classification (this as a subgenus of *Rutilia*); I agree whole-heartedly with the late Dr Paramonov's stricture that 'these genera are unwarranted and very often misleading, as they are based on erroneously identified species of the early workers'. It should be added, however, that many of Enderlein's species are valid, even if their descriptions are excessively perfunctory by 20th century standards.

The genera *Oxyrutilia* Townsend, *Ola* Paramonov and *Ruya* Paramonov do not appear in the present work although they were placed by their describers in the Rutiliini: the first of these genera is a synonym of *Nemoraea* Robineau-Desvoidy (tribe Nemoraeni) as Paramonov (1968 : 351) established, and the other two are excluded from the Rutiliini as here defined for the reasons given on p. 22.

The figures accompanying the text of this paper have all been drawn personally. Those of the male genitalia are in the form of simple outlines with the hair vestiture omitted, as it is *shape* which is important for recognition and highlights the essential differences (or resemblances)—over-fussy drawings with every hair in place are usually not a virtue in Calyptrate taxonomy (unless of course the characters, as sometimes happens, reside in the vestiture itself). Some of the drawings are semi-schematic, notably those of chaetotaxy, which is often better represented by the pores than by the bristles themselves.

Finally in this Introduction I must refer to my use of the subfamily name Proseninae. For some years this name has been current for the very large subfamily



once known (wrongly from the nomenclatural viewpoint) as the Dexiinae, and I have here continued to use the subfamily name Proseninae although it is clearly not the oldest available name for the taxon. The family-group name Proseninae dates from 1892, and is pre-dated by several family-group names proposed by Brauer & Bergenstamm (of which Rutiliidae itself is one) and probably by other even earlier names. It will be a very complex nomenclatural question to resolve which of the many family-group names in the Tachinidae are based upon genera belonging in the 'Proseninae', and which of them should be brought into use as the valid name for this subfamily; until this can be done thoroughly, with a real prospect of long-term stability, I consider it best to continue using the name Proseninae as I have done in the present work.

#### MATERIAL AND METHODS

The revisionary work presented here has been based on the extensive collection of Rutiliini housed at the British Museum (Natural History) and on the assembly of as many of the primary types as possible from overseas museums. Most of the types in depositories in Sydney and Canberra were examined during a visit to Australia in 1965, and Macquart's types (which could not be borrowed) were studied at the Paris museum in 1969. Primary types have been examined of 151 species-group nominal taxa out of the 168 for which type-material is known to be still in existence; for the remaining few names type examination was either not essential because the species were recently and very well described, or was not possible because types could not be loaned and there was no opportunity to examine them (e.g. Macquart's types of *Amphibolia valentina* and *Diaphania testacea* in Lille). Some types are lost (surprisingly few in view of the relative antiquity of many of the names) and a few have not been located but may still exist. The primary types of the 168 nominal taxa with located types are distributed as follows: 54 in British Museum (Natural History), London; 49 in Australian collections (Australian National Insect Collection, Canberra; Australian Museum, Sydney; School of Public Health and Tropical Medicine, Sydney); 34 in Museum für Naturkunde der Humboldt-Universität, Berlin; 14 in Museum National d'Histoire Naturelle, Paris; 12 in small European museums (Brussels, Leiden, Lille, Stockholm and Vienna); and 5 in North America (New York and Washington). Seven new species are described in the present paper from material in the British Museum (Natural History) and their holotypes are in this museum.

Small collections of Rutiliini from the museums at Oxford, Leiden and Paris, and from my own collecting in New Guinea and New Britain, were at hand and taken into account during the preparation of this paper.

The early stages of Rutiliines remain almost completely unknown, and only adult flies have been studied. These do not require any special techniques, but some comment may be helpful on preparation and figuring of male genitalia. Rutiliini, being bulky flies, have sizeable male genitalia which are difficult to slide mount satisfactorily, even with cavity slides, though permanent slide preparations should always be made using such slides; nearly always the hypopygium rolls at least slightly

out of position in a permanent preparation so that an undistorted profile or apical view is not given. It is therefore vital to examine the hypopygium in fluid and to compare the shapes of the surstyli and cerci against the figures *before* slide mounting. All the accompanying figures of the male epandrium, surstyli and cerci have been drawn from whole hypopygia removed from the flies, slightly softened in potassium hydroxide solution, and mounted in fluid to show either the shape in profile (lateral view) or in apical view. Some of the specific differences in shapes of surstyli and cerci are very subtle, and to get comparable posterior views the hypopygium has always been orientated in such a way that the sclerotized dorsal part of the epandrium is just visible above the 'open' membranous part. This should be kept in mind when comparing an apical view of the male hypopygium against the figures. As a rule it is not possible to obtain very satisfactory views of the male hypopygium by extracting it *in situ* on relaxed flies; some very important features lie at the bases of the surstyli and may be concealed under the epandrium and overlooked unless the hypopygium is completely removed, so that it can be viewed from various angles in fluid at least while an identification is being made. (Examination of the male hypopygium is only needed at the specific level, and as species do not normally show important characters on T5 or on sternite 5 it does not usually matter greatly if the surrounding parts of the abdomen are slightly damaged when the hypopygium is removed.)

When describing the leg chaetotaxy the convention is followed of imagining the leg to be extended at right-angles to the longitudinal axis of the fly, when: *ad* = anterodorsal, *av* = anteroventral, *pd* = posterodorsal, and *pv* = posteroventral. The close-set comb of setulae on the hind tibia of many forms is referred to as the *ad* fringe, using the conventional positional terminology '*ad*'; this equates with Paramonov's (1968) term 'externodorsal'.

The abbreviations used for thoracic chaetotaxy are: *acr*, acrostichal setae; *dc*, dorsocentral setae; *ia*, intra-alar setae; *ph*, posthumeral setae; *stpl*, sternopleural setae. Position before or behind the transverse suture of the mesonotum is indicated by *prst* (presutural) and *post* (postsutural) respectively, in the normal convention; hence *prst dc* indicates presutural dorsocentral setae, *post ia* indicates postsutural intra-alar setae.

Abdominal tergites are indicated by the letter T followed by the appropriate number; the composite first apparent tergite is T1 + 2, the last visible tergite T5 (Text-fig. 28). (It should be noted here that Paramonov (1968) referred to abdominal tergites by their apparent number, not by their correct numbering on the basis of morphological segmentation: his 'first' tergite is correctly T1 + 2, his 'second' and 'third' tergites are T3 and T4, and his 'fourth' tergite is T5.) For the convenience of Australian workers the terminology of the parts of the male hypopygium is that adopted by Colless & McAlpine (1970) in their work on Australian Diptera.

#### ADULT CHARACTERS AND THEIR TAXONOMIC VALUE

At present only morphological characters of adult flies are available for classification and species recognition. The following account details the characters that

have use in taxonomy at supraspecific and specific levels, and indicates briefly some of the features which (at any rate on present evidence) have no taxonomic usefulness.

#### BODY COLOUR AND POLLINOSITY

These are so closely interlinked, the appearance and pattern being largely determined by the distribution of the pollinosity and its density, that they are considered together. Useful specific characters, and to some extent supraspecific characters, are provided by the extent of visible metallic coloration; some taxa are characterized by having the parafrontals (sometimes also the parafacials) brilliantly metallic instead of pollinose (as is usual), and some have the genal dilations and epistome partially or entirely metallic. Metallic colouring of the abdomen is especially important, several segregates being characterized by the occurrence of transverse metallic bands or spots on most of the tergites (usually the metallic colour being golden green to coppery red). The presence and extent of metallic coloration on the abdomen provide useful characters at several levels, but in some groups there is conspicuous intraspecific variability; in some *Chrysorutilia* species, for example, the metallic pattern may consist of continuous transverse bands or of broken or partially coalesced metallic spots in the same species (and there is a tendency for females to have more complete banding than the males, which more frequently have the metallic pattern in discretely isolated spots).

The ground colour of the head and its overlying pollinosity often provide useful characters for distinguishing allied species, and some supraspecific aggregates may have a particular head colour (a brilliant golden yellow head is a common form which appears in unrelated groups). The thorax normally shows traces of whitish pollinosity over the prescutum at least, and conspicuous spots of 'thick' white pollinosity occur in many forms in a standard pattern on the thoracic dorsum and often on the mesopleura and sternopleura; the presence of such bold spots is often a specific or group character. In some species the spots, especially those on the mesopleura, may have a more 'shifting' appearance with the direction of the light than in others. The mesonotum typically shows four blackish vittae, and the boldness and extent of interruption of the vittae at the transverse suture sometimes provide (somewhat tenuous) specific differences. Some species and groups are characterized by having the thorax and abdomen uniformly dark, in which case mesonotal vittae are not evident.

Leg colour and, to a minor extent, antennal colour can provide useful specific characters. In some forms, however, such as *Chrysopasta* there appears to be intraspecific variability in leg colour, and it appears likely (but is yet to be proven) that some species of *Microrutilia* may have sexually dimorphic leg colour (black in males, reddish yellow in females).

Hair colour is of no importance at the supraspecific level and its significance at the species level is far from clear. Several very closely related and virtually inseparable species differ by having either black or mainly yellow pleural hair on the thorax, and it is possible that some species are polymorphic in hair colour; it seems probable, too, that some species may be sexually dimorphic in this feature, males having black pleural hair and females having yellow pleural hair (as in some species of the Goniine



genus *Winthemia* Robineau-Desvoidy). (In the present work it has been impossible to come to any definite conclusion about polymorphism or sexual dimorphism in hair colour, and nominal species have been treated as valid if their types differ in the colour of the pleural hair.) Colour of the parafrontal, genal, postbuccal, coxal, femoral, tibial, and ventral and apical abdominal hair has limited value as a specific character. Bristles of the chaetotaxy are nearly always black, but some of the bristling in a few species of *Chrysorutilia* is golden red (especially the postalar and vertical setae and the postocular setulae); the significance of this abnormal bristle colour is not clear.

#### CHAETOTAXY AND HAIRING

*Chaetotaxy in general.* The most striking feature of the chaetotaxy in the Rutiliini is its instability, much of the bristling being less constant in this tribe than in other Proseninae and incomparably less constant than in the higher Tachinidae (Tachininae and Goniinae). In the Goniinae, particularly, the principal bristles are very constant in arrangement and size, and whole tribes may have a uniform arrangement of many of the setae—for example all the Sturmiini have 3 + 4 dorsocentral setae. In the Rutiliini there is not only intraspecific variability among many of the setae in their number, but also in their degree of development and differentiation from the surrounding hair; there is often also a lack of bilateral symmetry in the bristling of individual specimens, and a few species are sexually dimorphic in certain of the setae (e.g. median marginal setae present on abdominal T<sub>3</sub> in females but absent in males). Failure to appreciate the inconstancy of the chaetotaxy led Enderlein (1936), working with rather limited material, to erect several untenable genera on the basis of supposed chaetotactic differences, and in the case of *Hega* Enderlein (based on male specimens) and *Chromocharis* Enderlein (based on females) to propose genera for the opposite sexes of the same taxa.

In spite of the variability in the chaetotaxy, and the fact that almost any chaetotactic character will fail in the occasional specimen, it is none the less the case that the chaetotaxy provides some of the most important characters for supraspecific classification—and that several of them are essential key characters by which genera and subgenera can be readily enough distinguished. The existence, however, of isolated specimens showing chaetotactic characteristics which conflict with the norm for their nominal taxon has always to be kept in mind (especially as it is virtually impossible to cover every conceivable variant in odd specimens in a practical key).

*Head chaetotaxy.* There are few features of the head setae of use in classification. The *ocellar setae* are normally small or virtually absent and but little differentiated from the long hair of the ocellar triangle. The *vertical setae* are represented only by the inner pair, which shows no useful features. The *frontal setae* are usually very small and fine (Text-fig. 3), often little more than short hairs, and frequently the two rows of frontals do not meet at the tips; critical examination might yield minor specific differences, but there are no obvious taxonomic characters in the frontal setae. *Proclinate orbital setae* are always absent in males and are often extra-



ordinarily reduced or absent in females; when present in females their size and number often vary, and may be different on each side of the same specimen, but nevertheless there is a tendency for their normal presence or absence in different segregates. The *vibrissae* are sometimes long and strong but most often are weakly differentiated from the peristomal setae and from the small setulae above the main vibrissae (Text-fig. 3); they have no real taxonomic use. The facial ridges are bare, but in *Chrysopasta* small setulae extend up them further from the main vibrissae than is usual. The row of *postocular setulae* varies somewhat in length and might, if sufficiently studied, show minor specific differences in males.

*Thoracic chaetotaxy* (Text-fig. 9). The most valuable chaetotactic characters are on the thorax, and several groups of thoracic setae provide generic and subgeneric characters. The basic number of *humeral setae* is four, two on the outer half and two on the inner half of the humeral callus, but in some *Rutilia* s.l. the inner pair is absent or virtually so. The posthumeral setae (*ph*) are typically developed in some genus-group segregates and undeveloped in others but are of very minor taxonomic usefulness; often their development is variable, and in males *ph* setae may be undifferentiated from the prescutal hair although distinct in females. The *acr* and *dc* setae are especially variable and almost no use has been made of them in the present work; in *Formosia* the presence of a distinct *prst dc* seta in one group and not in others has been noted. Some segregates characteristically show some strong slightly spiniform setae on the scutum between the hindmost setae of the *acr* and *dc* rows (so that the scutum shows a rather continuous transverse row of strong setae immediately before the scutellum); the presence or absence of these *supernumerary prescutellar setae* provides a minor taxonomic character. The pre-alar and supra-alar setae are extremely variable in development and have no taxonomic value; the *pra* seta may be present or absent in the same species or on the two sides of the same specimen, and there may be several supra-alar setae or only one in the same species. The *notopleural setae* are normal (1 + 1) in almost all forms, but a few curious species from the Philippines have a well developed third notopleural seta standing very close to the normal posterior notopleural (i.e. 1 + 2 notopleurals), the hind pair standing on an unusually prominent knob-like swelling of the notopleuron. Intra-alar setae occur only as *post ia* setae on the scutum, and there is never a *prst ia* seta in Rutiliini, but the *post ia* are often intraspecifically variable; typically in any species there may be only one *post ia*, but almost always occasional specimens will be found in which a second or even third *post ia* is present, and in species in which there is normally more than one there may sometimes be found only a single *post ia*; consequently the *ia* setae have very limited taxonomic value.

The most dependable thoracic setae for taxonomic purposes are the *postalar setae* on the postalar callus, the *sternopleural setae*, and the *scutellar setae*. Omitting *Chetogaster* (which has two postalar like normal Tachinidae) the Rutiliini are very exceptional in having more than the basic two setae developed on the postalar callus, there being either three very strong setae or four or five (exceptional specimens may even have six, with or without a weakly developed seventh seta). The possession of either three postalar or more than three appears without doubt to aggregate Rutiliine species into natural groupings, though the development of one

or more supernumerary postalar setae (in addition to the basic two) has evidently occurred several times over in different evolutionary lines—hence different genera and subgenera have either three or four (+) postalars, and the common possession of either of these numbers does not indicate that the genus-group taxa involved are necessarily phyletically close. Unfortunately the number of postalar setae is *not absolutely* dependable in every specimen, for very rarely specimens do occur in which the postalar callus has three setae on one side and four on the other (in this case it seems from other characters that such specimens always, or nearly always, belong to taxa in which 4+ is the norm for postalar setae). The sternopleural setae provide some useful supporting characters in the definition of genus-group segregates, some typically having only a single (posterior) *stpl* seta and others having either 1 + 1 or 2 + 1 *stpl*, but some variability occurs; for example groups normally having 2 + 1 may lack one of the anterior pair in some specimens or on one side of a specimen, and groups normally having 1 + 1 *stpl* may have the anterior one virtually indistinguishable from the sternopleural hairing (especially in the male). No taxonomic characters have been discovered in the mesopleural, hypopleural, propleural or prostigmatic setae; there is no definite pteropleural seta differentiated from the tuft of long strong pteropleural hairing below the wing-base in any Rutiliini.

The scutellar setae show characters of value in the definition of genera and subgenera. The number and strength of marginal scutellar setae vary much, but the position of the apical pair (whether inserted lower than or level with the other marginals) provides a very dependable character (in all *Formosia* s.l. for example the apical scutellars are level with the other marginal scutellar setae, whereas in *Rutilia* s.l. they are set at an obviously lower level on the tip of the scutellum). In some segregates the scutellum carries a transverse row of small but distinct preapical setae lying in the same horizontal plane as the marginals, and these provide a useful character (though there is some variability in their number and size it is nearly always certain whether they can be classed as present or absent).

In some forms the thoracic setae (especially the supernumerary prescutellars, if present, the scutellars, the postalars and some setae on the venter of the sternopleura in front of the middle coxae) are markedly spiniform; in this case they are usually stiffer, straighter and relatively shorter than in other forms. In some genus-group segregates (notably *Formosia* s.l. and *Rutilia* s.str.) the development of strong spiniform setae can be very striking, but it is difficult—because of intergradation with forms with more normal bristling—to use the spiniform nature of the setae as a taxonomic character.

*Leg chaetotaxy.* The legs provide few useful taxonomic characters. The setae of the fore and mid legs (such as the *pv* setae of the fore tibia and *ad* setae of the mid tibia) may vary in size and number and no useful features have been found. Some forms have very heavy spiniform bristling on the mid and hind coxa but this cannot be used as a dependable character. The development of the *ad* fringe of the hind tibia, whether formed as a regular close-set comb or as a sparse irregular row of *ad* setae and setulae, sometimes provides a helpful character, and is sometimes correlated with a different number of *pd* setae on the hind tibia (though this can be intraspecifically variable or show sexual differences, e.g. *pd* setae absent in

male but present in female). In *Formosia* s.str. the whole anterior surface of the fore coxa is haired, this feature distinguishing the segregate from all other Rutiliini (in which the anterior surface is bare except near the apex). In the genus *Prodiaphania* some valuable specific characters are provided by the setae of the ventral surface of the hind femur, and in some species by a series of long setulae found on the *ad* surface of the hind metatarsi of the male (such setulae occur nowhere else in the Rutiliini).

*Abdominal chaetotaxy.* The presence or absence of long strong setae on T<sub>5</sub>, of discal setae on the intermediate tergites, and of median marginal setae on T<sub>3</sub> provide useful characters at various taxonomic levels. The bristling of the inner ventral ends of the tergites, where they nearly meet in the mid line of the abdominal venter, varies much in strength and is sometimes spiniform; the direction of these setae, whether pointing downwards (as in *Formosia* s.l.) or mainly backwards and only slightly downwards (as in most other genera) has some value as a character at generic level. The arrangement and nature of the vestiture of T<sub>5</sub> are often especially important, some segregates showing long haphazardly arranged setae, others one or two regular transverse rows, and others having little more than sparse weak hairing; some unusual species from the Philippines show short stubby setae irregularly inserted over most of T<sub>5</sub>. In many forms the abdominal chaetotaxy is exceptionally strongly spiniform, but there are various degrees of 'spiniformity' in different genus-group taxa and the spinous setae cannot in themselves be used as a taxonomic character.

*Hairing.* The presence or absence, or extent, of hairing on different parts of the body can provide valuable taxonomic characters at species-group, or genus-group levels. In *Rutilia* s.l., for example, a valuable character for distinguishing the subgenera *Chryсорutilia* and *Ameniamima* from other subgenera (and indeed from all other Rutiliini) is the extent of hairing on the pteropleuron; in these segregates the hairing on the pteropleuron extends well forwards on the sclerite, reaching to a level much in front of the posterior *stpl* seta (Text-fig. 19), whereas in other Rutiliines the anterior half of the pteropleuron is bare and there is virtually no hairing in front of the level of the posterior *stpl* seta (Text-fig. 20). In *Formosia* s.str. the whole anterior surface of the fore coxa is haired, this feature distinguishing the segregate from all the other Rutiliini (in which the anterior surface of the fore coxa is bare except near the apex). Bare or haired parafacials distinguish many closely allied species, and some genus-group segregates contain only species having fully haired parafacials (e.g. *Chryсорutilia*). The barette is completely haired in nearly all Rutiliines but some *Chetogaster* species have the hindmost part of the barette bare; the type-species of *Chetogaster* and some closely allied species show a minute tuft of fine hairs on the mediotergite beneath the lower calypter (infrasquamal setulae), but the mediotergite is totally bare in all other forms. Rutiliini normally have the propleuron thickly haired, but very rare individual specimens (therefore no taxonomic significance) have it bare.

The most important taxonomic characters of the hairing lie in the postalar wall and the suprasquamal ridge (Text-figs 21-25), both of which may be haired (but



never both in the same taxon). In some genus-group segregates the postalar wall (i.e. the vertical lateral declivity of the postalar callus, below the rounded margin bearing the setae) has a thick tuft of long dense hair, but in most groups the postalar wall is bare (or at most has just one or two hairs on its extreme upper part immediately below the ridge of the callus); in other segregates the suprasquamal ridge is most often haired, either with long dense bushy crinkled hair which is so thick that the centre part of the suprasquamal ridge cannot be seen or with rather short sparse hair under which the whole of the ridge is clearly visible (the nature of the hairing therefore provides a useful character as well as its presence). A few segregates (including the genus *Rutilodexia*, the subgenus *Ameniamima* and some species of *Rutilia* s.str.) have both the suprasquamal ridge and the postalar wall bare, but most often one or the other of these structures is hairy.

Presence or absence of hair on the prosternal membrane (Text-fig. 18) has some taxonomic value. In *Chryсорutilia* and the aberrant species *Rutilia micropalpis* there is hair on the anterior margin of the prosternum as well as on the membrane, but hair actually on the prosternum itself does not occur in any other Rutiliini.

The hairing of the abdomen and male hypopygium shows no characteristics of supraspecific taxonomic value, but there are sometimes minor differences at the specific level in the length, strength and bushiness of the hairing, especially on the epandrium and surstyli. Hairing on the surstyli provides some particularly good specific characters in *Prodiaphania*.

Hairing on the arista ranges from extremely short micropubescence to moderately long plumosity, and is generally similar in the species of any particular subgenus; arisal hairing therefore provides a character of some minor value at the supra-specific level.

#### HEAD (Text-figs 1-3)

The most important taxonomic character at supraspecific level is the shape of the *facial carina*, which Paramonov (1968 : 355) used in the first couplet of his key to Rutiliine genera. Particular genera and subgenera usually show a moderately constant facies in carina shape, but there is normally also some intraspecific and interspecific variation and the character is not so easy to use in practice as Paramonov's key implies. In some segregates the carina forms a prominent convex knob between the antennal bases and becomes slender and sharper towards the epistome, while in others it is very broad along its length and has subparallel sides; the latter form of carina often shows, superimposed upon its basic shape, either a trace of a median sulcus or a median ridge. The *epistome* is always slightly prominent in profile, and often subnasute, and is rather constant in shape in any segregate; in forms with a bulbous facial carina the epistome is normally very prominent and the face in profile is deeply concave between carina and epistome, but in forms with a broad flattened carina the epistome is usually less prominent and not conspicuously differentiated in profile from the epistome by a deep saddle. Most Rutiliines have a well developed haired dilation on the gena (the so-called *genal dilation*), but in a few forms (especially *Rutilodexia*) there is very little genal dilation and the dilated part

is widely separated from the vibrissal area (not reaching nearly as far forwards on the head as the front of the eye, Text-fig. 5).

The eyes are well separated in both sexes in the majority of forms, but in *Formosia* s.l. many species have the male head nearly holoptic. In these the upper part of the frons is almost obliterated, and the upper ends of the very attenuated parafrontals may meet in the mid line (obliterating the upper part of the interfrontal area completely). When the eyes are very nearly touching, the uppermost facets are usually very conspicuously enlarged, and the closeness of the male eyes and facet enlargement can provide useful specific characters. In all Rutiliini the eyes are totally bare. The eye-height in relation to the width of the gena will probably provide significant specific differences when sufficiently studied. The ocellar triangle is exceptionally prominent in forms with the male head virtually holoptic (a correlated feature).

The form of the *buccal opening* provides a character of some taxonomic importance. In most forms the opening at its narrowest (near the middle) is conspicuously wider than the facial carina, but in the genera *Prodiaphania* and *Formodexia* the buccal opening is unusually elongate and narrow (especially in the male) and at its narrowest point is not or scarcely wider than the facial carina (Text-fig. 15). The proboscis is of very uniform length, never greatly elongate, and the *mentum* has two moderately distinct shapes (Text-figs 12 & 13) which are constant in any genus-group segregate: in one shape the upper and lower edges of the mentum are subparallel seen in profile so that the mentum is not noticeably tapering, and in the other the upper and lower edges seen in profile distinctly converge apically so that the mentum is tapering.

The *antennae* are always very small and their apices fall short of the epistomal margin by a distance about equal to, or only a little less than, their own length; they have no characters of supraspecific value, but the length of the third segment relative to the second sometimes provides a useful specific character. The *palpi* are minute (not longer than third antennal segment or basal thickness of the mentum) in *Prodiaphania* but are well developed, long and slender, in other forms (a little shorter than normal in *Rutilia micropalpis* and in *Chrysopasta*); they are sexually dimorphic in *Chetogaster* (slender in males, spatulate or clubbed in females) but not detectably so in other genera.

#### THORAX, LEGS AND WINGS

The structure of the thorax, legs and wings is extremely uniform and provides very few taxonomic characters. In a few species the posterior part of the notopleuron is produced as a knob-like swelling that is much more prominent than usual, but otherwise the thoraces are alike throughout the tribe. Some forms have slightly more elongate legs and tarsal claws than others, but not in any tangible way that can provide taxonomic characters. The tegula (epaulet) has a pair or more of long wiry setulae on its posterior edge in all Rutiliines except the one species of *Formodexia*. In some forms, especially species of subgenus *Donovanius*, the wing membrane is partially bare along some of the basal cells (at least no microtrichia visible by entomological microscope, although the S.E.M. microscope might prove them to

be present in reduced form), and it appears that this might provide a useful specific character. There are only minute differences in the relative proportions of the costal sectors, but the degree of dilation of the costal base provides a character of minor taxonomic use; some species have the costal base exceptionally strongly flattened and widened (explanate), especially in the male, and the explanate costal bases (i.e. the antecosta of Paramonov) then give the wings the appearance of having basal 'shoulders' which are very easily visible to the naked eye (especially in flies with the wings set back in the resting position). Partial or complete infuscation of the wings occurs in some species, and can provide a helpful specific character. Basicostal colour is also sometimes helpful.

#### ABDOMEN AND GENITALIA

*Abdominal form.* The abdomen is always very robust (Text-figs 28 & 29) and often conspicuously broad and slightly flattened, and the shape is moderately uniform in each genus-group segregate. The shape of T<sub>5</sub>—if convexly rounded and tapering posteriorly or whether short, very broad and deeply hollowed medially—provides an important character at supraspecific level. The degree to which the sternites are exposed between the approximated ventral ends of the tergites does not seem to provide any helpful characters except at the specific level in *Prodiaphania*. The bilobed *fifth sternite* of the male shows little variation through the tribe as a whole (Text-figs 30–35), the two lobes normally having a simple rounded shape (Text-figs 30 & 31), but an unusual shape of fifth sternite occurs in *Grapholostylum* (Text-fig. 33) and the lobes are straighter than usual apically in *Microrutilia* (Text-fig. 32). In the subgenus *Paramphibolia* each lobe has a small blunt tooth or prong on the inner edge towards the apex (Text-fig. 35), and this form of male fifth sternite occurs nowhere else in the Rutiliini.

*Male genitalia* (Text-figs 36 & 39). The general structure of the male hypopygium is exceedingly constant throughout the Rutiliini and there are really no characters of importance at the supraspecific level; even at the specific level the taxonomic characters are almost confined to the surstyli, with a few useful characters in the cerci and epandrium. The *hypandrium* (sternite 9), *pregonites*, *postgonites* and *epiphallus* (spinus) are virtually identical in every species, and the aedeagus itself has an astonishingly constant form. The only difference observed in the *aedeagus* between different species lies in the *distiphallus*, in which the relative lengths of the proximal sclerotized part and the membranous distal part vary slightly. In the majority of forms the membranous part of the *distiphallus* is about as long as the sclerotized part or a little shorter (Text-fig. 37), but in a very few species (mainly the subgenus *Grapholostylum*) the distal membranous part is unusually elongate and whip-like (nearing twice as long or so as the sclerotized length, as in Text-fig. 38). The *epandrium* (T<sub>9</sub>) is very large and shows some very minor differences in shape between species, but the differences are rather too intangible to have practical value in taxonomy. The *cerci* are elongate, not fused, and sometimes show differences in shape either in profile or posterior view which are useful for species recognition; they have no features of use for supraspecific characters. The most important structures by



far in the genitalia for taxonomic purposes are the *surstyli*; these show great diversity of shape, ranging from sharply pointed rather hook-like structures to enormous foliaceous lobes. In some groups the surstylus shape may be very constant (e.g. in *Donovanius*) throughout a range of species, but other groups may contain an admixture of species some of which have surstyli differing only by subtleties of outline and others of which have unmistakable surstyli showing some bizarre features. Broadly speaking, however, each genus-group segregate *tends* to show a surstylus shape with some common denominator—for example a surstylus always ending in a sharp tip or always with a subquadrate form.

*Female postabdomen.* This has not been studied in detail, but the examination of the postabdomen from representative females of different genera has not suggested the existence of good characters of value in supraspecific taxonomy. Detailed examination of species within a particular subgenus or genus will almost certainly, however, show up some differences that will enable females to be more reliably determined than at present.

#### KEY TO TRIBES OF THE SUBFAMILY PROSENIINAE IN THE ORIENTAL AND AUSTRALASIAN REGIONS

The subfamily Proseninae (=Dexiinae of authors) contains a vast assemblage of Tachinidae that occur in all the zoogeographical regions and subregions (except New Zealand) and appear to be exclusively parasites of beetles. If certain aberrant fringe genera are excepted the Proseninae as a whole has a facies which—in spite of great diversity in body shape and the degree of development of a facial carina—specialists on Tachinidae can recognize, even if they find it hard to pin down exactly what the diagnostic characters of the subfamily really are; certainly the form of the male aedeagus and its associated structures seems to provide some common denominator throughout the group. At present there is no available recent definition of the Proseninae, and the welter of world forms to be considered will make it difficult to arrive at a satisfactory definition that will work on a world basis. Likewise the completely satisfactory delimitation of tribal groupings within the subfamily will not be easy, and Townsend's various tribes in his *Manual of Myiology* need a thorough revision. In these circumstances I am not attempting here to provide a definition of the subfamily Proseninae, but I nevertheless think it useful to indicate the tribal entities which seem to justify recognition in the fauna of the Oriento-Australasian regions (in the area to which the Rutiliini are confined); an attempt will be made in a later work on the Tachinidae of New Guinea to elaborate complete diagnoses of the tribes and of the Proseninae as a whole.

The three tribes recognized in the Oriental and Australasian fauna are the Prosenini, Doleschallini, and Rutiliini, which can be distinguished by the following key.

- 1 Thorax closed above the hind coxae by a broad sclerotized bridge (as in *Cylindromyiini*), the hind coxae remote from the abdominal base. Head in profile subtriangular, profrons extraordinarily prominent and lower part of head strongly receding, head very much longer at antennal axis than at epistomal axis. No

facial carina. Notopleuron not differentiated from prescutum by any depression. Abdominal T<sub>1</sub> + 2 excavate only at base. Body and legs excessively long and slender, the long thin abdomen with subparallel sides. [Ceylon, Indonesia to Solomon Islands, unknown from Australia] . . . . . Tribe **DOLESCHALLINI**

[Type-genus: *Doleschalla* Walker, 1861]

- Thorax membranous or mainly so between bases of hind coxae and abdominal insertion, coxae and abdomen usually not remote from each other. Head in profile not subtriangular, at most only slightly shorter at the epistomal axis than at the antennal axis, often with epistome at least as prominent as profrons. Head usually with facial carina (absent in some forms). Notopleuron distinctly differentiated from prescutum by a groove or at least a shallow depression. Excavation of abdominal T<sub>1</sub> + 2 reaching to hind margin. Body form often robust, if long and slender then abdomen broadest near base or subfusiform . . . . . 2

- 2 Postalar callus with only the normal two strong setae (at most only a short weak setula in addition). Suprasquamal ridge and postalar wall bare. Epistome not produced in front of vibrissae or only weakly so, not readily visible in profile. Propleuron bare or haired. Barette bare or with a few hairs anteriorly (if all haired then no facial carina). Facial carina present or absent. Scutellum with three pairs of marginal setae. Male hypopygium without long strong erect setae on T<sub>7</sub> + 8 except in *Acucera*. Prosternal membrane and prosternum bare. Arista often very long-plumose. [nearly cosmopolitan] . . . . . Tribe **PROSENIINI**

[Type-genus: *Prosenia* Lepeletier & Serville, 1828]

- Postalar callus with supernumerary strong setae, total of 3-6 setae (except in *Chetogaster*<sup>1</sup>). Either suprasquamal ridge or postalar wall usually haired. Epistome subnasute or at least slightly and distinctly projecting in front of vibrissae in profile. Propleuron haired (*very rarely* bare in isolated specimens). Barette thickly haired along its length (partially bare in *Chetogaster*<sup>1</sup>). Strong facial carina present. Scutellum with four or more pairs of marginal setae (except in *Chetogaster*<sup>1</sup>). Male hypopygium with long strong erect setae on T<sub>7</sub> + 8 (usually standing in line on each side of tergite). Prosternal membrane, or membrane and prosternum itself, sometimes haired. Arista micropubescent to short-plumose (never very long plumose). [Oriental and Australasian Regions (except New Zealand)] . . . . . Tribe **RUTILIINI**

[Type-genus: *Rutilia* Robineau-Desvoidy, 1830]

### Tribe RUTILIINI Brauer & Bergenstamm

RUTILIAE Swainson in Swainson & Shuckard, 1840 : 377. Generic plural unavailable as family-group name (Article 11 (e) (i) of *International Code of Zoological Nomenclature*, 1961).

RUTILIIDAE Brauer & Bergenstamm, 1889 : 76, 152. Type-genus: *Rutilia* Robineau-Desvoidy, 1830.

AMPHIBOLIIDAE Brauer & Bergenstamm, 1889 : 76, 152. Type-genus: *Amphibolia* Macquart, 1843.

ROEDERIIDAE Brauer & Bergenstamm, 1889 : 76, 152. Type-genus: *Roederia* Brauer & Bergenstamm, 1893 [= *Chrysopasta* Brauer & Bergenstamm, 1889], junior homonym of *Roederia* Mik, 1881.

SENOSTOMATINI Townsend, 1932 : 40; Townsend, 1936 : 20, 154; Townsend, 1938 : 424. Type-genus: *Senostoma* sensu Townsend, not Macquart [misidentification] [= *Prodiaphania* Townsend]. SENOSTOMINI Enderlein, 1936 : 397, 435.

AGALMIINI Enderlein, 1936 : 397, 433. Type-genus: *Agalmia* Enderlein, 1936 (junior

<sup>1</sup> This genus is rather intermediate between Rutiliini and Prosenini but is here retained in its traditional position in Rutiliini.



homonym of *Agalmia* Enderlein, 1934) [= *Grapholostylum* Macquart, 1851, by subjective synonymy of type-species].

HABROTINA Enderlein, 1936 : 398 (subtribe). Type-genus: *Habrota* Enderlein, 1936 [= *ChrySORutilia* Townsend, 1915, by junior objective synonymy].

DIAGNOSIS. Facial carina well developed, usually broadly separating antennae. Antennae small, often falling short of mouth-margin by more than their own length; arista micropubescent to short-plumose. Epistome projecting at least slightly, usually very strongly and sharply, in front of vibrissae in profile, about as prominent as or more prominent than profrons. Vibrissae often reduced. Eyes bare, head in ♂ sometimes nearly holoptic. ♂ frons narrower than ♀ frons; proclinate orbital setae always absent in ♂, weak or absent in ♀. Proboscis short, not longer than head; mentum in profile parallel-sided or slightly tapering. Scutal chaetotaxy variable, often reduced. Scutellum, venter of sternopleura and mid and hind coxae often with stiff spiniform setae. Prosternal membrane (in *ChrySORutilia* anterior angles of prosternum also) sometimes haired. Propleuron haired (very rarely bare in isolated specimens). Barette usually fully haired. Infrascamulae setulae absent (except in some *Chetogaster* species). Postalar callus with 3-6 strong setae (except only two in *Chetogaster*). Postalar wall sometimes haired. Presutural intra-alar setae absent, 0-3(4) *post ia* setae. Suprascamulae ridge bare or haired. Lower calyptrae broad and abutting close to scutellum. Wing node with small inconspicuous setulae above and below, wings otherwise bare. Second costal sector bare below. Cell  $R_5$  open. Bend of vein *M* without appendix, very close to wing margin. Vein *Sc* meeting costa just basad of or level with *r-m*. Wings often with large dark area over basal cells. Abdomen very large, broad and widest near base, posterolateral corners often very prominent and  $T_5$  then often with median depression;  $T_1 + 2$  excavate to hind margin. Abdominal chaetotaxy often spiniform.  $T_1 + 2$  without median marginal setae.  $T_7 + 8$  of ♂ hypopygium with a group of long strong setae (usually 3 or 4 standing in line) on each side. Medium-sized to very large flies (length 6-22 mm), often brightly coloured and metallic or with conspicuous patterning.

IMMATURE STAGES AND BIOLOGY. Parasitic in large soil-inhabiting white grub larvae of Scarabaeidae (Melolonthinae, Rutelinae, Dynastinae) and in rotten-wood inhabiting larvae of Lucanidae: probably also parasitizing other related Scarabaeoid beetles. Eggs medium macrotype, slender, elongate and slightly bowed with rounded ends (Townsend, 1942, plate 21, figs 146 & 147). Habit larviparous; uterus enlarged, capacity of many hundred first stage larvae, these active and deposited on soil-surface. Stage I larva slender, elongate, with long terminal hairs, sometimes also some marginal segmental hairs; stage II larva unknown; stage III larva swelling towards posterior end, segmentation distinct, cuticle (in one species known) with covering of short colourless stubby hairs, posterior spiracles in form of very large slightly separated plates either flush with posterior surface or slightly sunken, plates perforated by very numerous minute pores or sinuate micro-slits, outer rim of plates thickened, button subcentral. Puparium (of the few known forms) with sunken posterior spiracles and covering of micro-hairs. Adult flies absent from desert areas, present in scrub or forest, settling on tree-trunks, posts, or underside of leaves in rain forest, females resting on ground only when larvipositing; attracted to flowers, notably *Eucalyptus*.

DISTRIBUTION. Widespread throughout, and confined to, the Oriental and Australasian zoogeographical regions (map, p. 163), but especially abundant in Australia. In Oriental Region occurring through south-east Asia from Ceylon and India to Philippines and Indonesia; in Australasian Region occurring in Australia

and Tasmania, Moluccas, Timor, Aru Islands, Kai Islands, New Guinea, Solomon Islands, New Hebrides, Fiji, Samoa, and Lord Howe Island. Unrecorded from New Caledonia, but probably occurring there. Absent from New Zealand.

DISCUSSION. Since the time of Brauer & Bergenstamm (1889) specialists in the Tachinidae have been agreed in regarding the Rutiliines as a named family-group segregate distinct from other Proseninae (=Dexiinae of authors), though the group has been variously ranked as a tribe, subfamily, or even occasionally as a family, and sometimes has even embraced the Ameniines—a curious group of calyptrate flies with an astonishing superficial likeness to the Rutiliines but now accepted as a subfamily of Calliphoridae (Crosskey, 1965). It is unnecessary here to review all of the varying interpretations of status and scope of the group, but the few major works of the past 35 years require brief consideration.

Townsend (1936) treated the one family Tachinidae, as currently accepted, as being seven families, of which the Rutiliidae were a small family on their own, placed between the Prosenidae and the Tachinidae in Townsend's narrow sense (Townsend, 1936 : 20, 150–156; 1938 : 410–427); Townsend's families are, however, very unsatisfactorily defined, and his family key has 84 exits (of which three are to Rutiliidae) for the separation of seven families. One of the exits to Rutiliidae in the key (Townsend, 1936 : 8) relates to those Rutiliines which have the suprasquamal ridge (=tympanic ridge of Townsend) haired, and there is never any problem in distinguishing these forms from all other Tachinidae: but it is much more difficult in defining the Rutiliines to take account of the forms which, though obviously Rutiliines also, have the suprasquamal ridge bare—for the characters of the Rutiliines as a whole then merge rather imperceptibly with those of the Prosenines (Prosenidae of Townsend). For this reason it is impossible to separate the Rutiliines from the Prosenines so distantly as to rank the groups equally (as Townsend does), and it is much better therefore to treat the Rutiliines as being a subgroup within the Prosenines (Dexiines of authors).

This view was well expressed by Mesnil (1939), in his general essay on Tachinid classification, as he divided the subfamily Dexiinae (Proseninae) into two tribes, Rutiliini and Dexiini (Prosenini), distinguishing the former from the latter by the prominent mouth-margin together with a few other less tangible features. My own view is very much in accord with that of Mesnil (1939), both as regards the affinities and ranking of the Rutiliines, and is elaborated in more detail in the following discussion (in which I have used the currently accepted names Proseninae and Prosenini in place of Dexiinae and Dexiini as used by many authors).

The vast complex of diverse forms which constitute the subfamily Proseninae is exceedingly hard to classify satisfactorily at any level, and almost any constellation of characters which appears to be satisfactory for defining a genus-group or family-group taxon when only a small collection or a limited regional fauna is available tends to become almost worthless for taxon definition when a comprehensive collection of worldwide forms is studied. Yet so great is the number of forms to be coped with that some segregation of family-group categories is needed, even if these are difficult to define in a fully satisfactory way and even if some genera are hard to

place into a subtribe or tribe with any confidence. Considering the whole of the Proseninae there is no doubt that the great bulk of forms constitute one very large tribe (Prosenini) containing much variety of form but united by all perceptible shades of intermediate characters, but that there are some other large groups or small groups that are more disjunct from the main body of forms and which can justifiably be ranked as tribes equivalent to the Prosenini; these include the Rutiliini, Doleschallini and Trixini, and perhaps a few other definable tribes when sufficiently studied. The Theresiini, Dexillini and Zeliini which Townsend (*Manual of Myiology*) treated as distinct tribes appear to me to be indistinguishable from Prosenini, and I am also doubtful whether the Trichodurini can be separated from the Prosenini either. The position of the subtribe Stominina of Mesnil (1939 : 52-53) is also very doubtful, but in my view it has scarcely any of the characters of the Rutiliini and cannot be placed in the Rutiliines where Mesnil has classified it: the characters of *Stomina* Robineau-Desvoidy appear to place this genus close to *Billaea* Robineau-Desvoidy in the Prosenini. At present the various tribal segregates within the Proseninae are insufficiently clarified, but the diagnosis here given should certainly distinguish the Rutiliini satisfactorily from all other Proseninae (except perhaps for the anomalous genus *Chetogaster*), and the key given in a foregoing section will separate the tribe from other tribes of Proseninae found in the Oriento-Australasian regions.

Although the Rutiliines have been so widely accepted as a family-group segregate, and are here ranked as a tribe on their own, it is impossible to characterize them as a whole by any simple character or small group of characters in a way that absolutely defines them. The best diagnostic feature (though it does not hold for the genus *Chetogaster*) is the presence of supernumerary strong bristles on the postalar callus; in all other Proseninae (and virtually all Tachinidae) there are only two strong setae on the postalar callus, sometimes accompanied by a long hair, but in all Rutiliini (excepting *Chetogaster*) there are at least three very strong postalar setae and sometimes from four to six. Another important character is the snout-like development of the epistome, which projects far in front of the vibrissae in profile (as mentioned by Mesnil, 1939), but some *Formosia* and *Rutilodexia* have the epistome only very slightly projecting, and resemble many Prosenines in this respect, so that this character, too, is not completely satisfactory. Many Rutiliini have the supra-squamal ridge thickly haired and others have a tuft of long hair standing on the wall of the postalar callus, and these features are never found in other Proseninae. The facial carina is always very strong in Rutiliini, and often very wide and flattened (then assuming a form almost never found among other Prosenines), and many members of the tribe have very strong erect spiniform setae on the abdomen or long strong spiniform setae on the scutellum and mid and hind coxae; such spiniform setae are of rare occurrence in other Proseninae, although they are found in several South American genera and in the Nearctic genus *Euchaetogyne* Townsend, but the New World forms which slightly resemble Australasian Rutiliini can always be easily distinguished by possessing only the two normal setae on the postalar callus and usually by having the propleuron bare (though in *Euchaetogyne* the propleuron is haired, as in the Rutiliini). The males of all Rutiliini have some very characteristic long strong bristles on tergite 7 + 8 of the hypopygium, these bristles standing in



two groups separated medially and normally consisting of three or four such setae standing in a transverse line on each side; long strong setae of this kind on T7 + 8 almost never occur in other Proseninae, though similar setae are found in the European genus *Deximorpha* Rondani and the Australian genus *Acucera* Malloch.

Enderlein (1936) divided the Rutiliines, which in his treatment ranked as a subfamily, into five tribes (of which two tribes are Ameniines), and Townsend (1936, 1938) divided his Rutiliidae into two tribes, but both of these workers are renowned for their taxonomic 'splitting' and later workers have, rightly in my view, declined to accept any validity for these tribes; nor have the many ill-defined and unnecessary genera erected by Enderlein (1936) been accepted (Paramonov, 1968 : 351, has pointed out that they are unwarranted, and often misleading because of misidentification of the type-species, and I agree entirely with Paramonov's view). In the present work no subtribes are recognized, and the scope of the Rutiliini is very similar to that shown by Paramonov (1968), except that the genera *Ola* Paramonov, 1968, and *Ruya* Paramonov, 1968 (of which the type-species and several other included species have been examined) are excluded: the facies of *Ola* and *Ruya* are not at all those of Rutiliini, both possess three strong *post ia* setae (such as rarely occur in Rutiliines), the conformation of the flat face is quite unlike Rutiliines, and there are many other features on which *Ola* and *Ruya* must be excluded from the tribe. It should be noted that Paramonov (1968 : 381) was himself doubtful about the inclusion of these genera in Rutiliini.

Paramonov (1968 : 350-352) has given an historical review of the description of Rutiliine genera, which need not be repeated here. Up to now 38 generic and subgeneric names have been proposed for Rutiliine flies, most of which are nomenclaturally available though many of them are considered taxonomically invalid in Paramonov's (1968) treatment and in the present work. Two names published by Paramonov (1968), viz. *Formotilia* and *Rutilusia*, are unavailable under Article 13 (b) of the *International Code of Zoological Nomenclature* because there is no fixation of a type-species for either genus. The names *Diaphania* Macquart, *Roederia* Brauer & Bergenstamm, *Agalmia* Enderlein and *Eucompsa* Enderlein are preoccupied homonyms, and the replacement name *Prodiaphania* Townsend is available for the first of these; the others are synonyms and do not require replacement names. The name *Eucompsa* Enderlein, 1936, in Rutiliini was proposed by Enderlein (1936 : 400) as a new genus, with *Rutilia minor* Macquart cited as type-species, although Enderlein had himself already erected the genus *Eucompsa* Enderlein, 1922, in Tabanidae, and *R. minor* was already type-species of *Microrutilia* Townsend: thus in one name Enderlein achieved the feat of publishing a junior objective synonym (of a Townsend genus) and a junior homonym (the latter of one of his own names)!

In the present re-classification of the Rutiliini I recognize the following eight genera: *Formosia* Guérin-Méneville, *Rutilodexia* Townsend, *Formodexia* gen.n., *Rutilia* Robineau-Desvoidy, *Amphibolia* Macquart, *Chrysopasta* Brauer & Bergenstamm, *Prodiaphania* Townsend, and *Chetogaster* Macquart. Three of these are divided into subgenera, three subgenera being recognized in *Formosia*, seven in *Rutilia* and two in *Amphibolia*.

A detailed study of the male genitalia throughout the tribe has shown that there

are no characters that can be used at the generic level (although differences in the shape of the surstyli and cerci can be very important in distinguishing species) and genera have to be characterized by externally visible features. Some of the genera are moderately distinctive and can be satisfactorily diagnosed, but others need to be characterized by aggregates of several features taken together (even then they may have to include species which clearly fit them on total facies but which fail to conform to one or more of the normal generic characters). It has to be borne in mind when using the keys that almost any character can fail in an occasional specimen.

KEY TO THE GENERA OF RUTILIINI

[*Note*: Tasmania is treated as part of Australia and is not separately cited in the geographical information.]

- 1 Suprasquamal ridge bare (Text-fig. 21). Prosternal membrane bare . . . . . 2
- Suprasquamal ridge haired (Text-figs 23 & 24). Prosternal membrane bare or haired (Text-fig. 18) . . . . . 7
- 2 Palpi minute, not longer than basal width of mentum and not longer than third antennal segment. Buccal opening very long and narrow (Text-fig. 15), at narrowest point not wider than facial carina. Arista conspicuously short-plumose. Upper parts of parafacials haired. Upper calypter enlarged, when wings folded usually as long as lower calypter. [Australia only]

**PRODIAPHANIA** Townsend (p. 107)

- Palpi well developed, very much longer than either basal width of mentum or third antennal segment. Buccal opening wide (Text-fig. 14), much broader than facial carina (except in *Formodexia*). Arista pubescent or occasionally with very short plumosity. Parafacials entirely bare (some exceptions). Upper calypter normal 3
- 3 Postalar callus with two strong setae (sometimes with one very much shorter and finer setula in addition differentiated from hair). Epistome subnasute, facial profile deeply excavate between epistome and carina (Text-fig. 8). Palpi sexually dimorphic, distinctly clubbed or spatulate in ♀ and slender in ♂. Infrsquamal setulae often present. Scutellum normally with only three pairs of marginal setae, at most with four (including the apical pair). [Australia only]

**CHETOGASTER** Macquart (p. 112)

- Postalar callus with three or more strong setae. Epistome not very strongly prominent, facial profile usually only slightly concave between epistome and carina (Text-fig. 4). Palpi not sexually dimorphic, long and slender in both sexes (at most only trace of swelling at extreme tip). Infrsquamal setulae absent. Scutellum normally with 4-11 pairs of marginal setae (including apical pair), very rare specimens with only three pairs . . . . . 4

- 4 Apical scutellar setae inserted at the same level as the other scutellar marginal setae (Text-fig. 11). Postalar wall with dense hair tuft (Text-fig. 25). Ventral margins of abdominal tergites with very strong spiniform setae directed downwards. Head often partly metallic. ♂ head sometimes holoptic or almost so. [Java to Solomon Islands, Australia] . . . . . **FORMOSIA** Guérin-Ménéville (p. 25)

- Apical scutellar setae inserted at a conspicuously lower level than the other scutellar marginal setae (Text-fig. 10). Postalar wall without dense hair tuft (except in *Formodexia*). Ventral margins of abdominal tergites without such vestiture, if marginal setae slightly spiniform then directed backwards as well as downwards. Head non-metallic. ♂ head never holoptic . . . . . 5
- 5 Postalar wall with dense hair tuft. Buccal opening very narrow, in ♂ scarcely at all

wider than facial carina. Tegula without long fine wiry setulae. Palpi exceptionally long and slender. Costal base explanate and with very long dense fringe (wings in folded position therefore appearing to have strongly developed 'shoulders'). [Moluccas only]. . . . . **FORMODEXIA** gen. n. (p. 38)

- Postalar wall without hair tuft, normally entirely bare (few specimens with a few hairs on extreme upper part adjacent to the dorsolateral ridge of the postalar callus). Buccal opening broad, very much wider than facial carina in both sexes. Tegula with normal long fine wiry posterior setulae. Palpi normal. Costal base not explanate (wings in folded position without appearance of prominent 'shoulders'). [Not from Moluccas] . . . . . 6

- 6 Genal dilation small, only extending forwards for about half the length of the genal region and not as far as the most anterior point of the eye (Text-fig. 5). Proboscis with slender mentum that is conspicuously tapering in profile (Text-fig. 13). Postalar callus with 4-6 setae *and* body without white pollen spots on sides of thoracic dorsum and the abdomen. Wing membrane distinctly tinged with brown or yellowish brown. [New Guinea, New Britain, Aru Islands]

**RUTILODEXIA** Townsend (p. 40)

- Genal dilation well developed, reaching forwards for obviously more than half the length of the genal region and as far as the most anterior point of the eye (Text-fig. 4). Proboscis with broader mentum in which sides subparallel in profile (Text-fig. 12). Postalar callus with either three strong setae only or with 4-5 setae *and* body with white pollinose spots on thorax and abdomen. Wing membrane (except for basal dark mark) clear hyaline or almost so. [Australia]

**RUTILIA** Robineau-Desvoidy (a few forms)

- 7 Dorsum of thorax with four broad bold black vittae which are interrupted at the transverse suture, appearing therefore to have eight elongate black spots (four on prescutum and four on scutum). Palpi much shorter than mentum. Postorbites with alternating silvery white and black spots which shift in appearance with direction of light. Facial carina strongly bulbous on upper part and strongly contracted with sharp median ridge on lower part. Parafacial hairing reaching below the lowest point of the eye and virtually continuous with hairing on genal dilation. [Western Australia only]

**CHRYSOPASTA** Brauer & Bergenstamm (p. 102)

- Dorsum of thorax without such pattern. Palpi as long or almost as long as mentum. Postorbites without pattern of alternating white and black areas. Facial carina broad and flattened on anterior surface with subparallel sides, or widened above and contracted ventrally (in latter case not normally formed into very narrow sharp ridge). Parafacials bare or haired, but if haired the hairing not normally extending below lowest point of eye in profile and well separated by conspicuous bare area from hairing on the genal dilations . . . . . 8

- 8 Intermediate abdominal tergites (T<sub>3</sub> and T<sub>4</sub>) without discal setae. Facial carina usually very broad and flattened, often slightly sulcate, with subparallel sides, at most only a little knob-like dorsally and contracted ventrally. Abdomen without bold black-and-white pattern (rare exceptions). Forms often with partly metallic head or with deep median depression in abdominal T<sub>5</sub>. [Widespread in Oriental and Australasian Regions] . . . . .

**RUTILIA** Robineau-Desvoidy (most forms) (p. 42)

- Intermediate abdominal tergites (T<sub>3</sub> and T<sub>4</sub>) with discal setae (lacking in occasional specimens on one or other of these tergites, very rarely on both; if absent then abdomen with bold black-and-white pattern). Facial carina widest dorsally between junctions of second and third segments of the antennae and conspicuously narrowed ventrally, not subparallel-sided and not flattened on anterior face. Abdomen most often with bold black-and-white pattern. Head never metallic, completely pollinose, and abdominal T<sub>5</sub> without wide median depression. [New Guinea, Australia and Lord Howe Island] . . . . . **AMPHIBOLIA** Macquart (p. 93)



Genus *FORMOSIA* Guérin-Ménéville

*Formosia* Guérin-Ménéville, 1843 : 263. Type-species: *Rutilia mirabilis* Guérin-Ménéville 1831, by monotypy.

DIAGNOSIS. Facial carina large, widening ventrally or with subparallel sides, at most only slightly widened medially. Epistome usually not strongly prominent. ♂ head holoptic or nearly so, eyes always strongly approximated, upper eye facets sometimes conspicuously enlarged and set off from small lower facets. Parafacials always bare. Buccal opening normal, if somewhat narrowed then conspicuously wider than facial carina. Genal dilation well developed, usually not reaching forward as far as front level of eye. Head often partly metallic. Arista pubescent or short-plumose. Palpi normal. Prosternum and prosternal membrane bare. Scutellum with apical setae at same level as, and not readily distinguishable from, other marginal setae; marginal setae stiff and straight, normally at least five pairs; disc of scutellum often markedly flattened. Postalar callus with 3-5 strong setae. Postalar wall with dense hair tuft. Suprasquamal ridge bare. Upper calypter normal. Tegula with normal long wiry posterior setulae. Costal base not explanate. Abdomen with stout spiniform setae directed downwards on ventral margins of tergites; T<sub>3</sub> with median transverse row of spiniform marginal setae (except in males of most *Euamphibolia* spp.); intermediate tergites without discal setae. T<sub>5</sub> short and broad, usually with well formed median depression and prominent posterior corners.

DISTRIBUTION. From Java to Solomon Islands and Queensland, one species (see *Euamphibolia*) reaching to Tasmania and Western Australia; especially well represented in Moluccas, New Guinea and Bismarck Archipelago. Unknown from Philippine Islands and possibly absent.

DISCUSSION. This is the predominant genus of Rutiliini in the Papuan subregion and contains many large and attractive species of beautifully patterned and metallic flies which often have a brilliant golden green to violet-blue coloration; the general appearance, both of shape and colour patterns, resembles that of many *Rutilia* species, and *Formosia* and *Rutilia* are without doubt very closely allied genera. Despite the superficial resemblance, *Formosia* is easily distinguished from *Rutilia*, and from all other genera of Rutiliini here recognized (except *Formodexia* gen.n.) by the presence of a thick tuft of long hair on the side wall of the postalar callus (Text-fig. 25). This is a remarkable and very unusual character which, to the best of my knowledge, does not occur elsewhere in the Tachinidae, and in the Rutiliini is confined to *Formosia* and *Formodexia* (though occasional specimens of *Rutilodexia* and *Rutilia* s.l. may have a very few hairs on the extreme upper edge of the postalar wall adjacent to the postalar rim). The features distinguishing *Formosia* from *Formodexia* are discussed under the latter genus, and a tabulation of the main differences between *Formosia* and *Rutilia* s.l. is given in the treatment of *Rutilia*.

Six genera have been described in the Rutiliini which are here considered not to be generically distinguishable from *Formosia*. These are *Pseudoformosia* Brauer & Bergenstamm, *Euamphibolia* Townsend, *Chromocharis* Enderlein, *Hega* Enderlein, *Laccura* Enderlein and *Pancala* Enderlein. Two of these names, however, apply to rather well defined segregates within *Formosia* s.l. which it is thought useful to recognize as subgenera, as these subgenera (viz. *Pseudoformosia* and *Euamphibolia*) can be defined by quite constant structural features which are associated with rather conspicuous differences in general facies and pattern. The other four names (all

provided by Enderlein in his usual lavish way) are treated as unnecessary synonyms applying to concepts for which older genus-group names are available: *Chromocharis* and *Hega* are placed as synonyms of *Euamphibolia*, *Laccura* as a synonym of *Pseudoformosia*, and *Pancala* as a synonym of *Formosia* s.str.

The male genitalia and fifth abdominal sternite in *Formosia* s.l. call for no special comment as they differ in no significant way from those of other Rutiliini or Proseninae in general. The shape of the surstyli (paralobes) is more square and 'heavy' in the subgenus *Euamphibolia* than in the other subgenera of *Formosia*, and males of this subgenus are therefore rather distinctive.

#### KEY TO THE SUBGENERA OF *FORMOSIA*

- 1 Postalar callus with 4-5 strong setae. One *post ia* seta (rarely none). Eyes of ♂ very strongly approximated or meeting, upper part of frons narrower than facial carina. Upper eye facets of ♂ often greatly enlarged. Head partly metallic (a few exceptions). No posthumeral setae. Mentum in profile normally rather slender and distinctly tapering (Text-fig. 13). Surstyli of ♂ genitalia of varied form but normally tapering on apical half and not subquadrate (Text-figs 41-44) . 2
- Postalar callus with three strong setae. 2-3 *post ia* setae (sometimes very weak fourth seta). Eyes of ♂ not very strongly approximated, never meeting, frons at narrowest at least as wide as and normally wider than the facial carina. Upper eye facets of ♂ not enlarged. Head non-metallic, entirely pollinose. Small posthumeral seta normally distinguishable among the prescutal hairing. Mentum in profile not unusually slender, upper and lower edges subparallel (Text-fig. 12). Surstyli of ♂ genitalia very heavy and subquadrate in profile (Text-figs 52 & 53)  
***EUAMPHIBOLIA*** Townsend (p. 33)
- 2 Anterior surface of fore coxa almost completely haired (Text-fig. 16). One sternopleural seta (0 + 1). Presutural dorsocentral setae absent. Abdominal T5 without long strong setae behind the main transverse row  
***FORMOSIA*** Guérin-Ménéville s.str. (p. 26)
- Anterior surface of fore coxa bare on inner half, except near apex (Text-fig. 17). Two sternopleural setae (1 + 1). At least one small presutural dorsocentral seta present on each side of prescutum, though sometimes very weak. Abdominal T5 with or without long strong setae behind the main transverse row  
***PSEUDOFORMOSIA*** Brauer & Bergenstamm (p. 31)

#### Subgenus *FORMOSIA* Guérin-Ménéville

*Formosia* Guérin-Ménéville, 1843 : 263. Type-species: *Rutilia mirabilis* Guérin-Ménéville, 1831, by monotypy.

*Pancala* Enderlein, 1936 : 422. Type-species: *Formosia callipygos* Gerstaecker, 1860, by original designation. **Syn. n.**

**DIAGNOSIS.** Head metallic, at least in some lights, on postorbital, genal dilation, parafrontals and usually also upper parafacials (except in *viridiventris* sp. n.). Head of ♂ holoptic or nearly so, upper interfrontal area obliterated or nearly so by meeting parafrontals, frons at its narrowest point not as wide as facial carina. Upper facets of ♂ eyes often much enlarged, ocelli then very prominent. Arista shortly plumose, hairs longer than basal thickness of arista. Mentum of proboscis rather slender, tapering distally. No posthumeral setae. No presutural dorsocentral setae. One strong *post ia* seta. One sternopleural seta (0 + 1). Postalar callus with 4-6 setae. Scutum often with supernumerary strong prescutellar setae between the hindmost *post acr* and *post dc* setae, the setae together forming a transverse prescutellar row. Disc of



scutellum usually conspicuously flattened. Fore coxa almost completely haired on anterior surface. Transverse row of erect median marginal setae of T<sub>3</sub> present in both sexes. T<sub>5</sub> without strong setae behind the transverse row (a few exceptions).

**DISTRIBUTION.** Occurring from Malaya and Java eastwards to the Solomon Islands, and known from Selangor, Java, Celebes, Molucca Islands (including Halma-hera, Ternate, Batjan, Morotai, Obi, Seram), New Guinea, Aru Islands, New Britain, New Ireland, Lavongai, Bougainville, and the major islands of the Solomons chain south-east to Guadalcanal. Unknown from Philippine Islands (possibly not represented there), absent from Australia.

**DISCUSSION.** *Formosia* s.str. is the largest subgenus in number of described species (and several additional undescribed species are known from the New Guinea area) and contains most of the brilliant metallic forms of Rutiliini that form such a characteristic element in the Tachinid fauna of the Papuan subregion. The subgenus is easily distinguished by the extensively haired fore coxae, in which almost all of the anterior surface is haired (Text-fig. 16), an unusual feature found nowhere else in the Rutiliini; in other Rutiliines, as in most Tachinidae, the inner half of the anterior surface of each fore coxa is almost entirely bare (there being only a few hairs towards the tip). The one sternopleural seta and the one posterior intra-alar seta, together in correlation, also uniquely distinguish *Formosia* s.str. from the other subgenera. A rather unusual character, too, though occurring in some other Rutiliini, is the slender tapering proboscis, and the strongly flattened scutellum of most forms is another feature exceptional among Rutiliini as a whole.

*Formosia* s.str. is especially well represented in the lowland rain forests of New Guinea and the Bismarck islands, where some species are common at times, but a few species also occur in small patches of relict forest in the New Guinea highlands. Adult flies can often be found resting on low herbage, especially on the undersides of the leaves of wild ginger and similar plants, but nothing is yet known of the host relations (almost certainly, however, Scarabaeoid beetles are the hosts).

Nearly all the species of *Formosia* s.str. form a rather homogeneous group having characters closely similar to those of the type-species, *F. (F.) mirabilis*, but a new species (described herein) from Guadalcanal, in the Solomon Islands, is rather disjunct from the main body of species—although it fits *Formosia* s.str. well in all essential characters—and is here treated as a group of its own. The two groups recognized are keyed and defined below.

#### KEY TO THE SPECIES-GROUPS OF *FORMOSIA* s.str.

- 1 Abdominal T<sub>5</sub> with some long strong erect setae laterally behind the transverse row.  
Head entirely thickly pollinose, nowhere metallic. Surstyli of ♂ genitalia in profile strongly acuminate and ending in sharp point (Text-fig. 49), the whole surstylus somewhat hook-like . . . . . *viridiventris*-group (p. 28)
- Abdominal T<sub>5</sub> without strong setae behind the transverse row of setae. Postorbital and genal dilations, sometimes also parafrontals and upper parafacials, metallic. Surstylus of ♂ genitalia not of this form, always rounded at tip (Text-figs 41-44) . . . . . *mirabilis*-group (p. 29)

THE *VIRIDIVENTRIS*-GROUP

DIAGNOSIS. Facial carina unusually narrow, in facial view subequal in width to an antenna. Head entirely pollinose, no bare metallic areas. Thorax and abdomen unicolorous dark green, no pattern. Abdominal T<sub>5</sub> with some long strong setae laterally behind the transverse row of setae. Surstylus of ♂ genitalia sharply pointed (Text-fig. 49).

## INCLUDED SPECIES

*Formosia (Formosia) viridiventris* Crosskey sp. n. GUADALCANAL. [Described below].

*Formosia (Formosia) viridiventris* sp. n.

(Text-fig. 49)

♂. *Head*. Ground colour blackish, except upper part of facial carina and lunula more reddish brown, interfrontal area velvety black-brown; head rather thickly yellowish white pollinose, nowhere metallic but trace of greenish colour showing through pollinosity along lines of postocular setulae. Parafrontal and genal hair blackish, occipital hair yellowish white. Eyes strongly approximated but head not holoptic, upper facets not enlarged, upper part of interfrontal area almost eliminated by coming together of parafrontals in mid line; frons at narrowest point 0.06–0.075 of head width, subequal to width of facial carina. Ocelli slightly raised, ocellar setae weak hair-like. Facial carina long, very slightly fusiform, longer than the epistome, facial profile only very slightly and evenly concave at junction of epistome and carina. Gena broad, 0.33–0.38 of eye-height. Parafacial about twice as wide as third antennal segment. Antennae dark reddish brown to blackish brown, more orange at junction of second and third segments, falling short of mouth-margin by about length of third segment; third segment 2.6–3.0 times as long as second segment; arista very short plumose. Palpi dark brown or dark reddish brown with slightly paler tips. Mentum tapering, rather slender. *Thorax*. Unicolorous very dark green or bluish green metallic, sometimes with violaceous tinges. Prescutum in some lights showing trace of four narrow blackish vittae and thin covering of whitish pollinosity, but these so inconspicuous that prescutum appears concolorous metallic greenish with the scutum. Thoracic hair all black except for postalar tuft pale yellow and the sparse hairing of the propleura yellowish white. Chaetotaxy normal, setae not markedly spiniform. Scutellum not flattened; with four pairs of strong marginal setae, these usually immediately preceded by some moderately strong horizontal preapical setae. *Wings*. Basicosta dark yellowish brown or reddish brown darkened to blackish brown anteriorly. Wing membrane pale smoky brownish with darker brown infuscation along the veins; infuscation conspicuous to naked eye and appearing more yellowish brown basally. Calyptrae dark brown with brown marginal hair. *Legs*. Black with entirely black hair; rather elongate and slender with femora attenuate on apical halves. Fore coxa fully haired anteriorly; mid femur without or with one *a* submedian seta; hind tibia with one strong *ad* seta, without *ad* fringe and without *pd* setae. Claws very long. *Abdomen*. Dorsum concolorous with thorax, uniformly metallic dark green or dark bluish green, venter violaceous towards the sides. Abdominal hairing entirely black; hair short, fine, and recumbent. Six setae in the transverse marginal row of T<sub>3</sub>. T<sub>5</sub> with some long strong setae standing among the hair on each side behind the setae of the main transverse row. Depression of T<sub>5</sub> deep and conspicuous. T<sub>7</sub> + 8 of hypopygium with only one or two long fine setae on each side, and these not very clearly differentiated from the hair vestiture. Genitalia (Text-fig. 49) with apical part of surstylus very strongly contracted, curved forwards and sharply pointed at tip (somewhat hook-like when seen in profile). *Measurements*. Body length 16.7–18.3 mm (mean 17.5 mm), wing length 14.7–16.5 mm (mean 15.6 mm) [4 specimens, holotype with minimum lengths indicated].

♀. Extremely similar to ♂ except for usual sexual differences. Interfrontal area very dark reddish brown, narrowing dorsally but width at minimum about twice as great as a parafrontal;

one pair of strong proclinate orbital setae. Vertex 0.16 of head width. Antennae more reddish than in ♂ (in the specimen seen). Body length 15.7 mm, wing length 13.4 mm [one specimen only seen].

#### MATERIAL EXAMINED

Holotype ♂, SOLOMON ISLANDS: Guadalcanal, Tapenanje, 10-30 [printed as 10-32].ix.1953 (*J. D. Bradley*). In British Museum (Natural History), London.

Paratypes. SOLOMON ISLANDS: 2 ♂, Guadalcanal, Gold Ridge, 1-2000 ft, 21.ix.1958 (*P. G. Fenemore*); 1 ♂, Guadalcanal, Honiara District, 500 ft, 2.i.1955 (*E. S. Brown*); 1 ♀, Guadalcanal, Honiara District, Mt Austen, 13.vi.1954 (*E. S. Brown*). All paratypes in British Museum (Natural History).

DISTRIBUTION. Known only from the island of Guadalcanal in the southern Solomon Islands.

AFFINITIES. A rather isolated and distinctive species (here placed in the separate species-group defined above) identifiable at a glance by the uniformly dark green body and infusate wings. The frons and vertex in the female are unusually narrow for the genus. No particular affinity with any other species is evident.

#### THE MIRABILIS-GROUP

DIAGNOSIS. Facial carina broad, in facial view conspicuously wider than an antenna. Head partly metallic, at least on postorbits and genal dilations, often also on parafrontals and upper parts of parafacials. Thorax and abdomen not unicolorous, abdomen with conspicuous pattern or if not then thorax or scutellum not concolorous with abdomen. Abdominal T<sub>5</sub> without strong setae behind the transverse row of setae. Surstylus of ♂ genitalia of varied form (Text-figs 41-44) but not sharply pointed at apex.

#### INCLUDED SPECIES

- Formosia (Formosia) blattina* (Enderlein) **comb. n.** CELEBES. [Holotype examined].
- F. (F.) bracteata* (Enderlein) **comb. n.** NEW IRELAND. [Holotype examined].
- F. (F.) callipygos* Gerstaecker. NEW GUINEA. [Holotype examined].
- F. (F.) eos* (Enderlein) **comb. n.** CELEBES. [Lectotype examined].
- F. (F.) fervens* (Walker). MOLUCCAS. [Holotype examined].
- F. (F.) flavipennis* (Macquart). JAVA, MALAYA. [Holotype examined].
- F. (F.) gemmata* (Enderlein) **comb. n.** NEW BRITAIN. [Lectotype examined].
- viridescens* (Enderlein). [Lectotype examined].
- F. (F.) glorificans* (Walker) **comb. n.** NEW GUINEA. [Holotype examined].
- pectoralis* (Walker) **syn. n.** [Holotype examined].
- fulvipes* (Enderlein). [Holotype examined].
- F. (F.) heinrichiana* (Enderlein) **comb. n.** CELEBES. [Holotype examined].
- F. (F.) heinrothi* (Enderlein) **comb. n.** NEW BRITAIN. [Holotype examined].
- F. (F.) mirabilis* (Guérin-Méneville). NEW GUINEA. [Holotype examined].
- plumicornis* (Macquart).
- F. (F.) solomonicola* Baranov **stat. n.** SOLOMON ISLANDS. [Lectotype examined].

KEY TO SPECIES OF THE SUBGENUS *FORMOSIA* S. STR.

[Note: *F. (F.) viridiventris* is omitted as it is easily recognized from the separate species-group characteristics and description already given. Specific limits are very uncertain at present for the other species, i.e. those of the *mirabilis*-group, and it is not yet clear to what extent the small differences in male genitalia provide dependable specific criteria. The following key is therefore very tentative and is merely a preliminary one which runs out the supposed species on the external characteristics shown by the types. Specimens exist in museum collections of undetermined species, possibly new, which will not necessarily run out in the key.]

- |   |  |                        |
|---|--|------------------------|
| 1 | Legs predominantly reddish yellow (at most only the tarsi blackish and some reddish darkening apically on the femora). Pleural regions of thorax with mainly pale yellow to golden orange hair. Epistome reddish yellow to pale tawny reddish. Third antennal segment orange (sometimes suffused with light brownish apically)   | 2                      |
| - | Legs black-brown to black (at most only apices of femora pale and tibiae sometimes a little reddish). Pleural regions of thorax with black or yellow hair. Epistome blackish brown to black. Third antennal segment dark reddish brown to black  | 4                      |
| 2 | Eyes of ♂ very strongly approximated, interfrontal area obliterated on the upper frons, frons at narrowest point not more than 0.04 of head-width; upper eye facets conspicuously enlarged. Hair of tibiae all black. Upper parts of parafacials conspicuously metallic in almost any light  | 3                      |
| - | Eyes of ♂ not very strongly approximated (separated by distance about three times as great as diameter of anterior ocellus), interfrontal area reaching to ocellar triangle, frons at narrowest point 0.08-0.10 of head-width. Hair of tibiae partly or largely golden red. Upper parts of parafacials rather thickly pollinose, hardly appearing metallic from any viewpoint. [Java]  | <i>F. flavipennis</i>  |
| 3 | Hair of fore coxae mainly golden orange (only the strongest vestiture black). Extreme costal base with golden red hairing ventrally. Tarsi reddish yellow to dark red, almost concolorous with remainder of legs. Crinkled hair of mesopleural hind margin almost all golden orange. Frons of ♂ at narrowest point subequal in width to anterior ocellus, about 0.04 of head-width. [Celebes]  | <i>F. eos</i>          |
| - | Hair of fore coxae mainly black (some golden hair at base). Hairing of costal base all black. Tarsi blackish, conspicuously darker than remainder of legs. Crinkled hair of mesopleural hind margin almost all black. Frons of ♂ extremely narrow, eyes nearly meeting, frons at narrowest point not as wide as anterior ocellus, only about 0.02 of head-width. [New Guinea]  | <i>F. glorificans</i>  |
| 4 | Hair of pleural regions of thorax all black  | 5                      |
| - | Hair of pleural regions of thorax largely pale yellow or golden  | 11                     |
| 5 | Forms from Celebes   | 6                      |
| - | Forms from Moluccas, New Guinea or Bismarck Archipelago  | 7                      |
| 6 | Calyptrae smoky brown with brown fringes. Postbuccal and genal hair black. Abdomen mainly a beautiful, brilliant, metallic blue; blue colour occupying most of each side of tergites 3-5 but divided medially by a broad bold black median vitta; hind margins of T3-T5 only narrowly black. Wings rather uniformly greyish brown infuscate. ♂ eyes separated by a distance only about equal to twice width of anterior ocellus, but interfrontal area not obliterated and reaching to anterior ocellus (interfrontal area conspicuous therefore even at narrowest point of frons and slightly wider at this level than a parafrontal) | <i>F. heinrichiana</i> |
|   | [This species is known only from the ♂ holotype]   |                        |
| - | Calyptrae pale orange-yellow with yellow fringes. Postbuccal and genal hair pale yellow. Abdomen without such blue-and-black pattern, tergites 3-5 each with a purplish red transverse band that is not, or only very faintly, interrupted   |                        |



- medially; the purplish red colour not strongly contrasting with the broad black tergite hind margins. [ $\sigma$  unknown] . . . . . *F. blattina*  
 [This species is known only from the  $\text{♀}$  holotype]
- 7 Abdominal pattern consisting of golden green, coppery green or reddish copper metallic bands on T<sub>3</sub>-T<sub>5</sub> which strongly contrast with a black centre line and black tergite hind margins; the metallic bands on each side usually distinctly arcuate, especially on T<sub>3</sub> and T<sub>4</sub>. [Moluccas and New Guinea] . . . . . 8
- Abdomen rather uniformly dark, the inconspicuous pattern consisting of a very dark blackish green or slaty bluish band across each tergite from T<sub>3</sub>-T<sub>5</sub> which is not medially interrupted and only very feebly contrasts with the black hind margin of the tergite; bands not at all arcuate. [Bismarck Archipelago] . . . . . 10
- 8 Calyptrae pale yellowish brown with pale yellow fringes; long fringe hair of outer side of upper calypter conspicuously yellow. Wing bases yellow-brown to naked eye. [Moluccas] . . . . . *F. fervens*
- Calyptrae brown or dark brown with pale brown to dark brown fringes; long outer fringe hair of upper calypter quite distinctly brown. Wing bases dark brownish to naked eye. [New Guinea] . . . . . 9
- 9 Metallic fascia on each side of T<sub>5</sub> with its hind margin excavate and therefore narrower on the centre part than at the inner end (the metallic band only reaching back to the level of the transverse row of setae at the inner end) . . . . . *F. mirabilis*
- Metallic fascia on each side of T<sub>5</sub> not noticeably excavate on the hind margin, extending back as far as, or almost as far as, the transverse row of setae (metallic band not wider at its inner end than elsewhere) . . . . . *F. callipygos*
- 10 Mesonotum and scutellum golden green to blue-green. Basicosta yellowish on posterior part and only infuscate anteriorly. [New Britain] . . . . . *F. gemmata*
- Mesonotum and scutellum mainly metallic coppery red or coppery purple, some coppery green colour on edges of prescutum and scutum. Basicosta uniformly black. [New Ireland] . . . . . *F. bracteata*
- 11 Abdomen uniformly purplish black (at most with paler reddish purple tinge on T<sub>3</sub>). Eyes of  $\sigma$  very nearly meeting, frons at narrowest subequal in width to anterior ocellus and 0.03 of head-width. [Solomon Islands, ? also New Britain]
- F. solomonicola*
- Abdomen black with brilliant metallic transverse bands on T<sub>3</sub>-T<sub>5</sub> ranging from golden green to greenish copper to silvery blue-green. Eyes of  $\sigma$  slightly more separated, frons at narrowest about one and a half times as wide as anterior ocellus and 0.05 of head-width. [New Britain] . . . . . *F. heinrothi*

Subgenus **PSEUDOFORMOSIA** Brauer & Bergenstamm

*Pseudoformosia* Brauer & Bergenstamm, 1889 : 126 (58). Type-species: *Formosia moneta* Gerstaecker, 1860, by monotypy.

*Laccura* Enderlein, 1936 : 431. Type-species: *Rutilia saturatissima* Walker, 1861, by original designation. **Syn. n.**

DIAGNOSIS. Head partly metallic, at least on upper occiput and genal dilations. Head of  $\sigma$  almost fully holoptic, upper interfrontal area eliminated by meeting of parafrontals, frons at narrowest hardly wider than anterior ocellus. Eyes of  $\sigma$  sometimes with upper facets enlarged. Arista short plumose, hairs much longer than basal thickness of arista. Mentum of proboscis rather slender, tapering distally. No posthumeral setae (trace of such setae present in occasional specimen). Usually one pair of small presutural dorsocentral setae present (occasionally undeveloped, especially in  $\sigma$  of *moneta*). One *post ia* seta (occasional specimens aberrant and without such seta or with trace of very small second *post ia* in addition). Two sternopleural setae (1 + 1), rarely with a supernumerary third seta in addition. Postalar callus with 4-6 setae, rather variable in degree of development. Scutum without supernumerary

setae in prescutellar region between the hindmost *post acr* and *post dc*. Scutellum not at all or only very slightly flattened on disc. Fore coxa bare on inner half of anterior surface, except near apex. Transverse row of erect median marginal setae of T3 present in both sexes. T5 with or without strong erect setae behind the transverse row.

**DISTRIBUTION.** Molucca Islands (including Halmahera, Ternate, Batjan, Morotai, Obi) and New Guinea. Absent from Australia and unknown (probably absent) from the Philippines.

**DISCUSSION.** This subgenus is very closely similar to *Formosia* s.str. but is easily and constantly distinguishable and I consider it best to treat it as a valid subgenus. It differs from *Formosia* s.str. by having two sternopleural setae and in having the inner anterior half of the fore coxa bare (as in *Euamphibolia*) and by some other more minor and less constant differences such as the presence in most specimens of a small but distinct presutural dorsocentral seta (though this seta is most often absent in the males of *F. (P.) moneta*). *Pseudoformosia*, like *Formosia* s.str., is confined to tropical areas but has a much more restricted distribution than *Formosia*, as it is apparently unrepresented anywhere west of the Moluccas (i.e. in the Oriental Region) or in the Bismarck Archipelago or the Solomon Islands.

As known at present the subgenus is small and contains only four species; it is not considered necessary therefore to recognize any species-groups at the present time. However, it may be noted that the type-species, *F. (P.) moneta*, differs from the other included species by having the parafrontals and epistome shining metallic green or blue, in lacking strong setae on T5 behind the main transverse row, and in having the upper eye facets of the male conspicuously enlarged; the other three species (listed below) have the parafrontals and epistome non-metallic, possess some strong setae laterally on T5 behind the transverse row, and have the male eye facets normal. One species (*pauper* de Meijere) has the entire body very dark brownish black with dark brown wings, but the other species more closely resemble typical species of *Formosia* s.str. in having beautiful brilliant coppery green or bluish green metallic patterns on the abdomen and green to violet colouring on the thorax.

Engel (1925 : 357) synonymized *Pseudoformosia* with *Formosia* and this generic synonymy was presumably accepted by Malloch (1929 : 309), as he placed *moneta*—the type-species of *Pseudoformosia*—in the genus *Formosia*. In a slightly later paper Malloch (1930 : 104) wrote that 'The two new species [i.e. *quadripunctata* and *cingulata*] belong to the subgenus *Pseudoformosia*', though he did not say how this subgenus differed from typical *Formosia*; however, Malloch's use of *Pseudoformosia* in subgeneric status means that no new status is involved in the present work. Enderlein (1936 : 427) treated *Pseudoformosia* as a synonym of *Formosia*, but used the latter genus in a very narrow sense (including in it only three species, most of the species here included in *Formosia* s.str. being placed in *Pancala* Enderlein by Enderlein).

#### INCLUDED SPECIES

***Formosia (Pseudoformosia) excelsa*** (Walker) **comb. n.** MOLUCCAS. [Holotype examined].

***F. (P.) moneta*** Gerstaecker. NEW GUINEA. [Holotype examined].

*lucigena* (Walker) **syn. n.** [Lectotype examined].

*obscuripennis* Brauer & Bergenstamm (unavailable name).

*F. (P.) pauper* (de Meijere) **comb. n.** MOLUCCAS. [Lectotype examined].

*F. (P.) saturatissima* (Walker). MOLUCCAS, ? NEW GUINEA. [Lectotype examined].

KEY TO SPECIES OF THE SUBGENUS *PSEUDOFORMOSIA*

- 1 Thorax and abdomen unicolorous dark brownish black (sometimes slightly purplish black) . . . . . ***F. pauper***  
     [♂ genitalia not distinguishable from *saturatissima* (Text-fig. 50)]
- Thorax mainly metallic green to violet-blue, abdomen with a pattern of metallic green or cupreous spots and bands against a black background . . . . . 2
- 2 Parafrontals metallic blue or green. Epistome metallic, distinctly shining blue or green with violet tinges. Metallic pattern of abdominal T<sub>4</sub> consisting of a pair of large spots on the mid dorsum and a pair of slightly crescentic marks on the venter against the fore margin of the tergite; T<sub>5</sub> similarly with two metallic areas on each side, one laterodorsal and the other ventral . . . . . ***F. moneta***
- Parafrontals thickly whitish or pale brownish pollinose, non-metallic. Epistome not metallic, dark brown. Metallic pattern of T<sub>4</sub> consisting of a single continuous band around each side from near the mid dorsum to the mid venter; T<sub>5</sub> with a single large metallic area on each side . . . . . 3
- 3 Abdominal T<sub>3</sub> with a single broad metallic band around each side which is continuous from near the mid dorsum to the mid venter. Wings clear hyaline or almost so. Surstyli of ♂ genitalia rather narrow and pointed (Text-fig. 51) . . . . . ***F. excelsa***  
     [This nominal species is known only from the teneral ♂ holotype in rather poor condition but appears to be distinct from *saturatissima*]
- Abdominal T<sub>3</sub> with a pair of small submedian metallic spots on the dorsum and with a narrow lateroventral metallic band on each side (some specimens may show traces of metallic colour slightly interconnecting the spots and bands). Wings brown with the infuscation most intense along the veins. Surstyli of ♂ genitalia wider and less sharply pointed (Text-fig. 50) . . . . . ***F. saturatissima***

Subgenus *EUAMPHIBOLIA* Townsend **stat. n.**

*Euamphibolia* Townsend, 1916 : 618. Type-species: *Rutilia fulvipes* Guérin-Méneville, 1843 [= *Rutilia speciosa* Erichson, 1842], by original designation.

*Hega* Enderlein, 1936 : 419, 421. Type-species: *Hega viridicingens* Enderlein, 1936 [= *Rutilia complicata* Walker, 1861], by original designation. **Syn. n.**

*Chromocharis* Enderlein, 1936 : 420, 432. Type-species: *Rutilia atribasis* Walker, 1861, by original designation. **Syn. n.**

DIAGNOSIS. Head thickly pollinose, nowhere metallic, at most only slightly shining in some lights on upper occiput. Eyes of ♂ not very strongly approximated, interfrontal area always distinguishable on upper part and at least as wide as parafrontal, frons at narrowest subequal in width to or much wider than facial carina. Upper facets of ♂ eyes not or only slightly enlarged. Arista micropubescent, pubescence at most only as long as basal diameter of arista. Proboscis in profile not noticeably tapering towards the apex, upper and lower edges subparallel. Posthumeral setae present, at least one each side and often more. 2–5 presutural dorsocentral setae (sometimes weak and scarcely differentiated from the hair in ♂). 2–3 *post ia* setae (sometimes small fourth seta and ♂ sometimes with only one main *post ia* seta preceded by a very small fine inconspicuous setula weakly differentiated). Two sternopleural setae (1 + 1),



anterior *stpl* sometimes very weak and hair-like in ♂. Postalar callus with three setae. Scutum without supernumerary prescutellar setae between the hindmost *acr* and *dc* setae. Disc of scutellum not conspicuously flattened. Fore coxa bare on inner half of anterior surface (except near apex). T<sub>3</sub> with a transverse row of median marginal setae either in both sexes or in ♀ only. T<sub>5</sub> with long dense hair behind the transverse row of setae in which some long strong setae developed.

**DISTRIBUTION.** From the Molucca Islands (including Halmahera, Ternate, Batjan, Seram, Buru, Run Island) through New Guinea to the Solomons, and in Australia from Queensland to Tasmania, also Western Australia. [No specimens have been seen from Bismarck Archipelago or Aru Islands but these areas are almost certainly within the subgeneric range: Osten Sacken (1881) recorded a specimen of *pretiosa* Snellen van Vollenhoven from Wokan in the Aru Islands.]

**DISCUSSION.** Townsend (1916) proposed the genus *Euamphibolia* for *Rutilia fulvipes* Guérin-Méneville, a large and attractive Rutiliine with a black-and-white body pattern superficially similar to that of some *Amphibolia* species (Brauer & Bergenstamm, 1889 : 418, had in fact placed *fulvipes*, though attributing the species to Macquart, in the genus *Amphibolia*). This distinctive species was described by Erichson (1842) with the name *Rutilia speciosa* in the year before Guérin-Méneville's (1843) description of *fulvipes* was published; nevertheless it is clear from Guérin-Méneville's account that he knew of Erichson's name, for he expressed some doubt as to whether his *fulvipes* was really distinct from Erichson's *speciosa*. Later authors have had no doubts that the names are synonyms: the synonymy of *fulvipes* with *speciosa* was implied by Malloch (1927 : 351) when he cited *speciosa* as the genotype of *Euamphibolia*, was formally established by Townsend (1932 : 38), and was cited by Enderlein (1936 : 430) and Townsend (1938 : 414). Direct comparison of original types is not possible, for although Erichson's types still exist (and have been examined) that of Guérin-Méneville is lost: but Guérin-Méneville's detailed description of *fulvipes* applies so perfectly to Erichson's types of *speciosa* that I here accept the synonymy as certainly correct (as this is in accord with previous practice there is no need of neotype designation for *fulvipes*). (It should be noted that Townsend, 1932, 1938, was in error to state that a holotype—sex unspecified by Townsend—of *fulvipes* from New South Wales is in Paris Museum: there is no such specimen in Paris, although Macquart's collection contains material determined as *fulvipes* by Macquart.)

Malloch (1927 : 351) wrote of *speciosa* as follows: 'This is the genotype of *Euamphibolia* Townsend, but I do not consider it entitled to generic separation from *Formosia*, the only character distinguishing it being the pubescent arista. It may ultimately be accorded subgeneric rank with *atribasis*.' I completely agree with Malloch's views (although there are certainly more characters than the pubescent arista which distinguish *Euamphibolia* from *Formosia* s.str.) and here accord to *Euamphibolia* the status of a subgenus within *Formosia* s.l. In agreement also with Malloch, I consider Walker's *atribasis* to be consubgeneric with *speciosa*, and the generic name *Chromocharis* Enderlein (of which *atribasis* is type-species) therefore enters into new synonymy with *Euamphibolia*.

The generic name *Hega* Enderlein is also a new synonym of *Euamphibolia*.



Enderlein characterized *Hega*, and differentiated it from related genera, by the lack of median marginal setae on abdominal T<sub>3</sub>, without realizing that in the group of species to which the type-species (*viridicingens*) belongs the lack of median marginals on T<sub>3</sub> is only a sexual character. The males lack such setae and the females possess them. The genitalia of the males, with the very heavy subquadrate surstyli, are of an identical kind with the male genitalia of *speciosa*, and confirm beyond any doubt that *Hega* is a synonym of *Euamphibolia*.

The subgenus *Euamphibolia* as here re-defined is easily distinguished from the other subgenera of *Formosia* by the characters given in the accompanying subgeneric key. Apart from the characteristic shape of the ♂ surstyli (see Text-figs 40, 52, 53), *Euamphibolia* is immediately and most easily distinguished from *Pseudoformosia* and *Formosia* s.str. by the presence of only three setae on the postalar callus and by the rather broad non-tapering shape of the mentum when seen in profile (Text-fig. 12).

At present *Euamphibolia* contains only a small number of species. Two of these, *speciosa* and *fusca* sp. n., are very distinct from the others because of their coloration, but as there are so few species and no really tangible structural characters on which they can be grouped it has not been thought useful to recognize any species-groups as formally defined entities.

Very little is known of the early stages and host relations. Townsend (1936 : 152) has briefly described the first stage larva, and has also figured the egg and first stage larva under the name *E. fulvipes* (Townsend, 1942, plate 21, fig. 147; plate 30, fig. 249; and plate 43, fig. 250). Two specimens have been seen of an undetermined species of the subgenus from Lae, in New Guinea, which have associated puparia and data showing that the larvae were found in a sago-palm trunk parasitizing the larvae of a Cetoniid beetle. Otherwise nothing is yet known.

#### INCLUDED SPECIES

- Formosia (Euamphibolia) atribasis* (Walker). MOLUCCAS. [Lectotype examined].
- F. (E.) complicata* (Walker) **comb. n.** MOLUCCAS; WEST IRIAN. [Holotype examined].
- pretiosa* (Snellen van Vollenhoven) **syn. n.** [Lectotype examined].
- sapphirina* (Walker) **syn. n.** [Holotype examined].
- smaragdifera* Bigot **syn. n.** [Lectotype examined].
- viridicingens* (Enderlein) **syn. n.** [Holotype examined].
- F. (E.) engeli* (Enderlein) **comb. n.** RUN ISLAND, BURU. [Lectotype examined].
- F. (E.) faceta* (Enderlein) **comb. n.** AUSTRALIA (Queensland); NEW GUINEA. [Holotype examined].
- F. (E.) fusca* Crosskey **sp. n.** SERAM. [Holotype examined].
- F. (E.) smaragdina* Malloch. AUSTRALIA (Queensland). [Holotype examined].
- F. (E.) speciosa* (Erichson). AUSTRALIA (Australian Capital Territory, New South Wales, Queensland, Tasmania, Victoria, Western Australia). [Lectotype examined].
- fulvipes* (Guérin-Méneville) [Holotype lost].

KEY TO SPECIES OF THE SUBGENUS *EUAMPHIBOLIA*

- 1 Legs entirely reddish yellow. Dorsum of thorax black with bold white spots and vittae. Abdomen with black-and-white pattern. Palpi yellow. Pleural regions of thorax with yellow to golden orange hair. Hair of coxae and femora largely golden orange. [Australia and Tasmania] . . . . . *F. speciosa*
- Legs entirely black or brownish black. Dorsum of thorax not so, greenish to blue-violet or if blackish (*fusca*) then without white spots. Abdomen not black-and-white. Palpi dark brown or blackish. All thoracic hair black. Hair of coxae and femora all black . . . . . 2
- 2 Thorax and abdomen unicolorous dark black-brown. [Seram] *F. fusca* sp. n. (p. 37)
- Not unicolorous dark species, dorsum of thorax and usually also much of the abdomen metallic greenish, cupreous, blue or violaceous, the abdomen always noticeably banded or patterned . . . . . 3
- 3 Hair of occiput and postbuccae all black. Head pollinosity distinctly bicolorous, white on lower parts of parafrontals and on parafacials, postorbites, and most of genae, and pale golden brown on upper parts of parafrontals and on occiput, facial carina, antennal foveae and epistome (golden brown colour of parafrontals best seen from above). Thorax without white pollinosity, with only merest trace of yellowish brown pollinosity thinly over humeral calli and fore margin of prescutum. Dorsum of T<sub>5</sub> with a pair of widely separated golden green subtriangular metallic areas which extend back only about as far as the main transverse row of setae. [Batjan] . . . . . *F. atribasis*
- Hair of occiput white or yellow, hair of postbuccae usually also pale but occasionally brownish. Head pollinosity unicolorous white, greyish white or yellowish white. Thorax usually with some white pollinosity on prescutum and humeral calli, often also on mesopleuron and sternopleuron. Dorsum of T<sub>5</sub> with metallic areas not of this form . . . . . 4
- 4 Dorsum of abdomen with broad dark coppery red or purplish bands on each side of T<sub>3</sub>-T<sub>5</sub> which are clearly separated medially on all tergites (T<sub>3</sub>, therefore, as well as other tergites with distinct black median vitta); the dark colour of the metallic bands not strongly contrasting with black areas of tergites and abdomen appearing generally dark. Wings very conspicuously brown. [Run Island and Buru] . . . . . *F. engeli*
- Dorsum of abdomen with a bold pattern of golden green, reddish green, emerald or blue metallic areas on a black background, the abdomen not appearing rather uniformly dark. Wings mainly clear hyaline or nearly so (except for usual black basal area), only weakly suffused with yellowish brown along the veins . . . . . 5
- 5 Abdominal T<sub>5</sub> with the metallic areas covering most of the dorsum, at most only the posterolateral corners of the tergite and a very fine inconspicuous median line black. ♀ without definite sternopleural pollinose spot and with rather thin white pollinosity over mesopleuron which has a distinctly shifting appearance from different angles. Upper occiput metallic greenish adjacent to the postocular setulae. ♂ frons at narrowest 0.14-0.15 of head-width. [Moluccas and West Irian] . . . . . *F. complicita*
- Abdominal T<sub>5</sub> with metallic areas confined to middle part of tergite dorsum, sometimes evanescent so that T<sub>5</sub> is virtually all black in ♂, metallic areas of T<sub>5</sub> dorsum usually in form of two irregular elongate golden green areas which nearly meet posteriorly in the tergite depression and together are roughly V-shaped. ♀ with a small but definite pollinose spot on the upper sternopleuron and with a boldly marked white pollinose spot on mesopleuron which does not strongly shift with the light direction. Upper occiput either metallic or non-metallic adjacent to postocular setulae. ♂ frons at narrowest 0.12-0.13 of head-width . . . . . 6
- 6 Upper occiput evenly white pollinose and showing little or no trace of metallic colour

near the postocular setulae. White pollinosity of humeral calli and prescutum of ♀ thick and very conspicuous to naked eye, making anterior half of thoracic dorsum appear rather greyish (except for the black vittae). Pollinose spot of sternopleuron weakly marked and partly brownish. Submedian pair of black marks on the anterior edge of scutum (i.e. the ends of the inner pair of black mesonotal vittae) more or less connected by dark brown coloured area medially. Small species, length 12.5-16 mm. [Queensland and New Guinea] . . . . . *F. faceta*

- Upper occiput distinctly metallic green in the area of the postocular setulae. White pollinosity of humeral calli and prescutum of ♀ inconspicuous to naked eye, not distinctly reaching to transverse suture, whole mesonotum appearing bright metallic green or blue-green. Pollinose spot of sternopleuron very distinct, almost entirely white like the mesopleural spot. Submedian pair of black marks on anterior edge of scutum (ends of the inner pair of black mesonotal vittae) small and square and widely separated by the metallic green colour, which reaches medially to the front edge of the scutum (transverse suture). Large species, length 17.5-20 mm. [Queensland] . . . . . *F. smaragdina*

### *Formosia (Euamphibolia) fusca* sp. n.

(Text-fig. 40)

♂. *Head.* Ground colour blackish brown, slightly more reddish brown on facial carina, antennal foveae and upper genae; lunula shining yellowish brown, interfrontal area velvety brownish black; head rather thickly yellowish white pollinose on anterior parts, more thinly greyish white pollinose on occipital regions. Parafrontal and genal hair black, occipital hair reddish brown. Eyes not very strongly approximated and upper facets not enlarged; upper interfrontal area distinct and nearly twice as wide as parafrontal, frons at narrowest about 0.14 of head width and wider than facial carina. Ocelli slightly raised, ocellar setae undeveloped. Facial carina nearly twice as long as epistome, subparallel-sided. Gena one-third (0.33) of eye height. Parafrontal about 3.5 times as wide as width of third antennal segment and much wider than length of this segment. Antennae dark reddish-brown, very small and falling short of mouth-margin by very much more than their own length; third segment about 2.1 times as long as second segment; arista micropubescent. Palpi brown with paler tips. *Thorax.* Blackish brown with very thin brownish pollinosity, non-metallic; scutellum slightly more reddish brown than scutum. Thoracic hair entirely black. Chaetotaxy normal for subgenus but setae rather small [*post ia* setae and postalar setae of left side and some marginal scutellar setae missing from holotype, but pores distinct]. Anterior sternopleural seta minute, almost hair-like. Scutellum with five pairs of marginal setae, and one or two smaller irregular submarginals. *Wings.* Basicostae and basal spots extremely dark, almost black; membrane mainly hyaline except for narrow traces of yellowish brown colour immediately adjacent to veins. Calyptrae dark brown with brown marginal hair. *Legs.* Black with entirely black hair; femora not conspicuously attenuate. Mid tibia without *ad* setae and without definite *p* setae; hind tibia with extremely well developed long close-set *ad* fringe, without *ad* seta among the fringe, and without *pd* setae. Claws very long. *Abdomen.* Entirely blackish brown with black hair, concolorous with thorax. Dorsal hair exceedingly fine and abundant, recumbent on T<sub>3</sub> and very dense medially, semi-erect on T<sub>4</sub> and erect on T<sub>5</sub>. T<sub>3</sub> without median marginal setae; T<sub>5</sub> with some long setae developed among the long fine hair posteriorly to the transverse row of setae. Depression of T<sub>5</sub> well formed and conspicuous. Genitalia as in Text-fig. 40. *Measurements.* Body length 18.2 mm, wing length 18.5 mm [one specimen, holotype].

♀. Extremely similar to ♂ except for usual sexual differences. Interfrontal area only slightly narrowing dorsally; proclinate orbital setae absent. Vertex 0.25 of head width. Facial carina more pinched in at lower end than in ♂. Body length 20.0 mm, wing length 18.8 mm [one specimen].



## MATERIAL EXAMINED

Holotype ♂, INDONESIA: Moluccas, Seram (=Ceram), Mansela, 2500 ft, 1919 (Pratt). In British Museum (Natural History), London. [Genitalia on slide.]

Paratype. 1 ♀, INDONESIA: Moluccas, Seram (*A. R. Wallace*) (BMNH, London).

DISTRIBUTION. Known only from the island of Seram (=Ceram) in the Moluccas.

AFFINITIES. A very distinctive species readily identified at a glance by the unicolorous blackish brown colour and large size; no particular affinity with another species is evident at present. Although only one male and one female are available so far, I have no hesitation in describing the new species because it is so clearly distinct from all other known species of the subgenus *Euamphibolia*, to which *fusca* sp. n. is certainly assignable.

Genus *FORMODEXIA* gen. n.

Type-species: *Rutilia volucelloides* Walker, 1861.

DIAGNOSIS. Facial carina large, with subparallel sides and at most only slightly bulbous medially, convex on outer surface. Epistome not very strongly prominent, weakly set off from carina by shallow depression. Eyes of ♂ very strongly approximated so that upper frons slightly narrower than facial carina, the upper facets not noticeably enlarged. Parafacials bare. Buccal opening very narrow, in ♂ hardly wider than facial carina. Genal dilation moderately developed, not reaching forward as far as front level of eye. Head nowhere metallic. Arista pubescent. Palpi of both sexes exceptionally long and slender. Proboscis rather long and slender and slightly tapering before the labellae. Prosternum and prosternal membrane bare. Scutellum with apical pair of setae inserted at lower level than other marginal setae; total of six or seven pairs of marginals; disc of scutellum not flattened. Postalar callus with 5 setae. Postalar wall with dense hair tuft. Suprasquamal ridge bare. Upper calypter normal. Tegula without the usual long wiry posterior setulae. Costal base explanate and with well formed close-set curved marginal fringe, wings appearing to have basal 'shoulder' to naked eye. Abdomen without downwardly-directed spiniform setae on ventral margins of tergites; T<sub>3</sub> without either median or lateral marginal setae; intermediate tergites without discal setae. T<sub>5</sub> convex, without median depression or prominent posterolateral corners, apical part (behind the single transverse setal row) sharply bent downwards in ♂.

DISTRIBUTION. Only known from the Moluccas, including the islands of Halma-hera and Batjan; probably occurring also in other islands of the Moluccas group.

DISCUSSION. The curious Rutiliine species described by Walker as *Rutilia volucelloides* (of which two other Walker names are synonyms, as indicated later) from the Molucca islands has a suite of characters which preclude it from being placed satisfactorily in any of the genus-group segregates of Rutiliini already described, and in order to present a balanced classification of this tribe it is necessary to assign *volucelloides* to a new genus, for which the name *Formodexia* gen. n. is proposed.

*Formodexia* gen. n. agrees with *Formosia*, and differs from all other Rutiliine genera, by having the postalar wall haired, but it differs from *Formosia* in having the apical scutellar setae set lower than the others, in the explanate costal base and lack of wiry posterior hairs on the tegula, and in lacking the strong downward-pointing spinous setae on the abdominal venter which are characteristic of *Formosia*;

the same differences also distinguish *Formodexia* from *Rutilodexia*. *Formodexia* resembles *Rutilia* in having the apical scutellar setae at a lower level than the other marginal setae, but is easily separated from all *Rutilia* species by the hairy postalar wall and from almost all *Rutilia* by having the suprasquamal ridge bare.

There is a strong superficial resemblance between *Formodexia* and *Prodiaphania*, especially because of the explanate costal bases of both sexes in both genera and because of the strongly narrowed buccal opening, but *Formodexia* is very easily distinguished from *Prodiaphania* by the exceedingly long slender palpi (palpi extremely reduced in *Prodiaphania*), by the haired postalar wall (postalar wall bare in *Prodiaphania*), by the pubescent arista (arista plumose in *Prodiaphania*) and by the normal small upper calypter (upper calypter much enlarged in *Prodiaphania*).

Although *Formodexia* is unlikely to be confused with the remaining Rutiline genera it may be useful to note the following distinctions: the new genus differs from *Chrysopasta* by having the postalar wall haired and the suprasquamal ridge bare and in the bare parafacials, and the same features of the postalar wall and the suprasquamal ridge distinguish it also from *Amphibolia* (but some species of the latter agree with *Formodexia* in having bare parafacials). From *Chetogaster*, which only doubtfully belongs to the Rutiliini, it may be separated at once by the five setae on the postalar callus (only two such setae in *Chetogaster*).

Additional features of *Formodexia* to those cited in the diagnosis, given to facilitate comparison with various subgenera of *Rutilia* and *Formosia*, are as follows: no development of strong spiniform setae on either thorax or abdomen; setae of pre-scutum and scutum reduced, *post ia* setae absent; two sternopleural setae (1 + 1); claws of ♂ unusually small; ♀ without proclinate orbital setae; hind tibia with short well developed and close-set *ad* fringe; head of ♂ appearing unusually small in relation to body size; both sexes with a row of well developed setae along the basal half of the *a* surface of the mid femur.

A surprising aspect of *Formodexia* is the extreme paucity of material so far known of *volucelloides*, the only species: I know of only five specimens, all in the British Museum (Natural History), of which three are Walker's types of three synonymic names and the other two are old specimens from Batjan that formed part of Bigot's collection. Of the five specimens, only the primary type (lectotype herein designated) of *volucelloides* is a male, but the species is so distinctive that there is no doubt whatever that the four female specimens are conspecific with this male; as a consequence, Walker's names *trixoides* and *ignobilis* fall as new synonyms of *volucelloides*.

Enderlein (1936), without seeing Walker's types and therefore without any real idea of their characters, assigned *ignobilis* to *Chrysorutilia* Townsend and assigned *volucelloides* and *trixoides* to his genus *Donovanius*, thus in effect associating these names with *Rutilia* (for *Chrysorutilia* and *Donovanius* are, in the present treatment, regarded as not generically distinguishable from *Rutilia*). As already shown, all three specific names belong to one species which is not assignable to *Rutilia*.

Attention may usefully be drawn here to an error in Walker's citation of type-locality for *ignobilis*: this was originally recorded in error as Gorrite (in Brazil), but the correct type-locality (as indicated by a label on the specimen in Walker's writing) is southern Gilolo (=Halmahera) in the Molucca islands.

## INCLUDED SPECIES

- Formodexia volucelloides* (Walker) **comb. n.** MOLUCCAS. [Lectotype examined].  
*trixoides* (Walker) **syn. n.** [Holotype examined].  
*ignobilis* (Walker) **syn. n.** [Holotype examined].

Genus *RUTILODEXIA* Townsend

- Rutilodexia* Townsend, 1915 : 23. Type-species: *Rutilia angustipennis* Walker, 1859, by original designation.  
*Bothrostira* Enderlein, 1936 : 413. Type-species: *Bothrostira prisca* Enderlein, 1936, by original designation. **Syn. n.**  
*Rutilosia* Paramonov, 1968 : 355. [Name published in footnote to generic key: unavailable under Article 13 (b) of *International Code of Zoological Nomenclature*, no fixation of type-species.]

DIAGNOSIS. Facial carina large and subparallel-sided, at most slightly widened medially, often slightly sulcate. Epistome not strongly prominent, separated from facial carina by very shallow depression only. Eyes of ♂ not very strongly approximated, upper frons at least as wide as and usually a little wider than facial carina, upper facets not enlarged. Parafacials bare. Buccal opening wide, very much wider than facial carina in both sexes. Genal dilation weakly developed, anterior edge very remote from epistome. Head nowhere metallic. Arista pubescent. Palpi fully developed normal size. Proboscis short, rather slender and tapering before labellae. Prosternum and prosternal membrane bare. Scutellum with apical pair of setae inserted at lower level than other marginal setae (apicals sometimes hair-like); total of 7-11 pairs of marginals; disc of scutellum not noticeably flattened. Postalar callus with 4-6 setae. Postalar wall bare (at most a very few hairs adjacent to those on callus edge). Suprasquamal ridge bare. Upper calypter normal. Tegula with normal long wiry posterior setula. Costal base not explanate. Abdomen with slightly spiniform setae ventrally on tergite margins which are directed downwards and backwards; T<sub>3</sub> without median marginal setae in ♂, with single pair of such setae in ♀; intermediate tergites without discal setae. T<sub>5</sub> broad, without or with at most only slight median depression, posterior corners not prominent.

DISTRIBUTION. Aru Islands, New Guinea and New Britain.

DISCUSSION. It is considered best to recognize *Rutilodexia* Townsend as a valid genus for a small group of species found (so far) only in the Papuan subregion and differing on total suite of characters from the species placed in *Rutilia* s.l., though undoubtedly *Rutilodexia* is very closely allied to *Rutilia* and does not differ from it by very convincing characters. The general appearance of *Rutilodexia* species is very similar to some *Rutilia* (especially in the subgenus *Donovanius* Enderlein), and *Rutilodexia* has the bare postalar wall and low-set apical scutellar setae exactly as in *Rutilia*; furthermore, the facial carina is exactly of the *Rutilia* type. The supra-squamal ridge is, however, bare in *Rutilodexia* and this character provides a distinction from almost all of *Rutilia* species; in *Rutilia* the supra-squamal ridge is nearly always haired, but there are some species which (on overall balance of characters) must be placed in *Rutilia* even though the ridge is bare. The best feature for distinguishing all *Rutilodexia* from all *Rutilia* seems to lie in the genal dilation (Text-figs 4 & 5); in *Rutilodexia* this is unusually small and its anterior limit is formed by an oblique ridge extending downwards from behind the eye; in *Rutilia* the genal



dilation is more or much more extensive and rounded anteriorly. In *Rutilodexia* the anterior part of the genal dilation is very remote from the epistome and is not as far forward on the head as the level of the front of the eye; in *Rutilia* the anterior part of the dilation normally reaches forward to or beyond the level of the front of the eye and is thus less remote from the epistome.

The ♂ genitalia of *Rutilodexia* species have no special characteristics; the surstyli and cerci have a simple form (Text-fig. 90) generally resembling that found in a number of *Rutilia* s.l. species.

The form of the genal dilation and close resemblances in all other characters indicate without doubt that *Bothrostira prisca* Enderlein is congeneric with, though a separate species from, *Rutilodexia angustipennis* (Walker), and Enderlein's generic name *Bothrostira* therefore falls in new synonymy with *Rutilodexia*. It is certain also that Paramonov's (1968) posthumously published and unavailable name *Rutilosia* applies to the same concept (because the manuscript notes left at his death show that Paramonov included *angustipennis* Walker in *Rutilosia* without him appreciating that this nominal species was already type-species of *Rutilodexia*). Comparison of Enderlein's types of *B. prisca* (♂) and *Idania ralumensis* (♀), in conjunction with later collecting of both sexes, shows that both names apply to the same species; as *ralumensis* is certainly the female of *prisca* (though Enderlein (1936 : 409, 413) had the nominal species in separate genera) the names are here placed in new synonymy, with *prisca* treated as the valid name because based on a male type. *R. papua* (Bigot) is perhaps the same species as *R. angustipennis* (Walker) but there is not sufficient evidence at present to justify synonymy.

Nothing is known of the hosts of *Rutilodexia* species.

INCLUDED SPECIES

- Rutilodexia angustipennis* (Walker). ARU ISLANDS. [Holotype examined].
- R. papua* (Bigot) **comb. n.** NEW GUINEA. [Lectotype examined].
- R. prisca* (Enderlein) **comb. n.** NEW BRITAIN. [Holotype examined].
- ralumensis* (Enderlein) **syn. n.** [Lectotype examined].

KEY TO SPECIES OF THE GENUS *RUTILODEXIA*

[Note: The primary types of *angustipennis* and *papua* are male and female respectively, and the opposite sexes cannot yet be positively associated.]

- 1 Males . . . . . 2
- Females . . . . . 4
- 2 Hind tibia with a strong submedian *ad* seta and a very weak inconspicuous *ad* fringe.  
Hind femur with a row of strong *av* setae on the apical half. [Aru Islands & New Guinea] . . . . . *R. angustipennis*
- Hind tibia without a submedian *ad* seta and with a well developed regular close-set *ad* fringe. Hind femur without strong *av* setae on apical half, the vestiture hair-like (New Guinea & New Britain) . . . . . 3
- 3 Dorsum of thorax and abdomen contrasting in colour, the mesonotum and scutellum metallic dark green or bluish green and the abdomen tawny yellowish with a conspicuous black median line. [New Britain] . . . . . *R. prisca*
- Dorsum of thorax and abdomen more or less concolorous, dark brownish or blackish brown with a purplish green or violaceous sheen and without a noticeable dark median line on the abdomen. [New Guinea] . . . . . Undetermined sp. (? *papua* ♂)

- 4 Hair of the barett, posteroventral parts of the pteropleuron and outer edge of postalar callus golden yellow (in contrast with black hair on remainder of thorax). Prescutum with only indistinct traces of dark vittae. Head tawny or dark reddish with brassy yellow pollinosity. Wings rather conspicuously smoky on apical half and yellowish on basal half. [New Britain] . . . . . *R. prisca*
- Hair of barett and all hair of pteropleura and postalar calli black like the rest of the thoracic hair. Prescutum with four bold black-brown vittae. Head blackish brown with pale greyish yellow pollinosity. Wings not strikingly yellow and smoky brownish. [New Guinea] . . . . . *R. papua*

### Genus *RUTILIA* Robineau-Desvoidy

*Rutilia* Robineau-Desvoidy, 1830 : 319. Type-species: *Tachina vivipara* Fabricius, 1805, by subsequent designation of Crosskey (1967 : 26).

DIAGNOSIS. Facial carina large, often broad with subparallel sides, sometimes slightly knob-like or slightly evanescent ventrally. Epistome slightly to very strongly prominent. ♂ head never holoptic, upper frons at least as wide as facial carina, upper eye facets not enlarged. Parafacials bare or haired. Buccal opening normal, wider than facial carina in both sexes. Genal dilation well developed, usually rounded anteriorly and extending forwards nearly to level or beyond level of front of eye. Head normally mainly pollinose, partially metallic in some forms. Arista virtually bare to very short-plumose, usually pubescent. Palpi fully developed normal size (except reduced in *micropalpis*). Proboscis short with sides subparallel in profile or at most only a little tapering before labellae. Prosternum and prosternal membrane bare or haired. Scutellum with apical pair of setae inserted at lower level than other marginal setae (very rarely apicals absent); total of 3–10 pairs of marginals; disc of scutellum convex or flattened. Postalar callus with 3–5 (rarely 6) setae. Postalar wall bare (at most a very few hairs adjacent to those on callus edge). Suprasquamal ridge almost always haired, bare in a few species. Upper calypter normal. Tegula with normal long wiry posterior setulae. Costal base sometimes distinctly explanate. Abdomen with marginal vestiture of tergite venters weak and semi-recumbent (directed backwards), if bristling slightly spiniform then not directed vertically downwards; T<sub>3</sub> with or without median marginal setae; intermediate tergites without discal setae. T<sub>5</sub> of varied form, convex truncate conical to broad and flattened with median depression.

DISTRIBUTION. Especially well represented and widespread in Australia, but occurring also in Oriental Region from India and Ceylon through Malaya to Philippines and Timor; poorly represented in New Guinea, occurring in Solomon Islands, New Hebrides, Fiji, Samoa and Lord Howe Island. Absent on present evidence from Moluccas and Bismarck islands.

DISCUSSION. The genus *Rutilia* in the wide sense here adopted (which corresponds in the main with the sense of the genus adopted by Malloch and Paramonov) is the largest genus of Rutiliini and contains nearly half the described species. It is the dominant element in the Rutiliine fauna of Australia, and contains most of the large metallic and boldly patterned species that are such a conspicuous element in the Australian dipterous fauna. The genus is not easy to define in a completely satisfactory way, and the diagnosis has perforce to take into account several species that differ from typical *Rutilia* in some conspicuous feature, even though on their totality of characters they must clearly be assigned to the genus: for example, some species have the suprasquamal ridge bare (e.g. *cingulata* Malloch and *confusa* Malloch, which were erroneously placed in *Formosia* by Malloch because of this), and

occasionally specimens occur which lack the apical setae of the scutellum. The differences between *Rutilia* and other Rutiline genera have been alluded to elsewhere under the different genera and need not be repeated here, but it might be useful to emphasize the chief differential characters which separate *Rutilia* and *Formosia*, for there has always been some difficulty in separating these genera satisfactorily since the time when Guérin-Ménéville (1843) first distinguished them. The table below indicates the main differences:

<i>Rutilia</i>	<i>Formosia</i>
Postalar wall bare (at most a very few hairs immediately below edge).	Postalar wall with dense hair tuft.
Suprasquamal ridge haired (bare in a few exceptions).	Suprasquamal ridge bare.
Apical scutellar setae inserted below level of other marginal setae (very rarely absent).	Apical scutellar setae inserted level with other marginal setae.
Marginal setae of abdominal tergite venters usually very weak, recumbent, at most only slightly spiniform and directed backwards as well as downwards.	Marginal setae of abdominal tergite venters very strong, spiniform, directed straight downwards.

Some supposed genera have been split off from *Rutilia* by various authors but not generally accepted as separate genera (e.g. *Microrutilia* Townsend, *Chrysorutilia* Townsend), and Enderlein (1936) fragmented *Rutilia* into eleven genera placed in two subtribes, using such features as the present or absence of median marginal setae on abdominal T<sub>3</sub> or the presence or absence of a median depression in the last abdominal tergite (T<sub>5</sub>) as generic characters. In the present work none of these genera has been considered valid as a taxon worthy of generic rank, but a few have been redefined in the light of the characters shown by the type-species and recognized as subgenera within *Rutilia*; in all, seven subgenera are here recognized and defined, for six of which there are pre-existing genus-group names available (these including *Rutilia* s.str.) and for one of which a new subgeneric name is proposed (there being no previously published name applying to the taxon concerned). The subgeneric name *Neorutilia* Malloch and the following sixteen generic names are synonyms of *Rutilia* s.l. (the correct synonymic distribution of these names according to the subgeneric classification here proposed is shown at the head of each subgenus): *Agalmia* Enderlein, *Chrysorutilia* Townsend, *Donovanius* Enderlein, *Eucompsa* Enderlein, *Grapholostylum* Macquart, *Habrota* Enderlein, *Idania* Enderlein, *Menevillea* Enderlein, *Microrutilia* Townsend, *Philippiformosia* Townsend, *Prosenostoma* Townsend, *Psaronia* Enderlein, *Psaroniella* Enderlein, *Pogonagalmia* Enderlein, *Stiraulax* Enderlein and *Zoramisceus* Enderlein.

Though the numerous species of *Rutilia* s.l. (some 60 species at present, but several undescribed species known) show great diversity in their general appearance—size, colouring, pollinose patterns—and though a few species are difficult to place satis-



factorily in any particular segregate, it is generally true that the great majority of species can be placed alongside obviously allied species where together they form natural subdivisions of the genus, each of which can be reasonably well characterized and differentiated from other such segregates. It is here considered best to treat these major groupings of the species as subgenera, a course which has not previously been adopted with *Rutilia* (except for Malloch's (1936) recognition of his new species *simplex* as representing a new subgenus, and his recognition of subgenus *Microrutilia* in the same paper). The seven subgenera recognized can be distinguished by the accompanying key and diagnoses, but it may be useful to draw attention here to some general conclusions to which I have come before formulating these subgenera.

It is certainly unwise in *Rutilia* (as indeed generally in the Tachinidae) to aggregate species into a defined taxon merely on the common possession of a single character, or to attach too great an importance to some single striking attribute that may well have, and usually almost certainly has, been evolved more than once within the whole complex of forms. This course forced Malloch to place species such as *confusa* Malloch and *cingulata* Malloch out of *Rutilia* and in *Formosia* instead, simply because on the single character of bare suprasquamal ridge they are atypical for *Rutilia*, though on their overall totality of characters these species clearly fit *Rutilia* and not *Formosia*. Yet within *Rutilia* the rest of the characters shown by *confusa* and *cingulata* leave little doubt that these two species are not closely allied, and an unnatural group would be formed by defining a taxon (subgenus or species-group) which brought these species together: it seems certain that bareness of the suprasquamal ridge has arisen more than once within *Rutilia*, so that while the character can be usefully used as one of the characters of an infrageneric taxon it cannot be used as an exclusive diagnostic feature. Similarly, the depression in the last visible abdominal tergite (T5), which is such a conspicuous feature of many *Rutilia* species and was used as a generic character by Enderlein, has undoubtedly in my view arisen at least twice in separate lines of evolutionary development in the genus: it occurs principally in the subgenus *Donovanius* but is also found in *Rutilia* s.str., groups which seem to resemble each other convergently but differ much when all their characters are taken into account.

In *Rutilia* the chaetotaxy is often very variable, the number of setae and their degree of development often showing great inconstancy within a species and between sexes (females normally have a stronger chaetotaxy and may show development of certain setae that are usually totally lacking in males), and also sometimes showing imperfect bilateral symmetry. Hence chaetotactic characters must be used with great caution and long series of specimens require study before any conclusions can be made about which setae, if any, are more or less dependable. The acrostichal, dorsocentral, intra-alar and supra-alar setae are, speaking generally, too inconstant in number and strength to be of real value in providing group characters or specific characters, and the sternopleural and posthumeral setae (especially the latter) show some variability which makes their usefulness limited (though the sternopleurals can usefully be used, and are here used, as a supporting character in defining the subgenera). The humeral callus has two moderately strong setae on the outer half in

nearly all specimens, and some *Rutilia* s.l. have one or two very fine humerals developed and distinguishable from the hair on the inner half of the callus as well; though a somewhat intangible character, it does seem that the setae on the inner half of the callus are almost never developed in the subgenus *Chryсорutilia*, whereas at least one and usually two humerals are (even if very fine) normally differentiated from the hair on the inner half of the callus in other subgenera.

An extremely important chaetotactic character among *Rutilia* s.l. is the number of strong setae on the postalar callus, and I find this to be one of the most useful characters that exists (on present knowledge) for dependably segregating the species into their respective subgenera. This feature of the chaetotaxy, whether there are three postalar setae or whether there are four (or more) such setae, provides an almost completely dependable character for distinguishing some subgenera from others—though very occasional specimens are found in which there are three postalars on one side and four on the other. If the species of *Rutilia* are assembled on the basis of their common possession of three and four postalar setae it is found that the resulting groupings appear without doubt to reflect a natural dichotomy within the genus, and that distinct taxa (subgenera) can then be defined on the basis of several other characters taken in combination with the postalar character. Omitting the small subgenera *Neorutilia* and *Ameniamima* subgen. n. (of which the affinities are rather obscure) the great bulk of *Rutilia* species are comprised here in the present re-classification in five subgenera, three in the section possessing the three postalar setae and two in the section with four such setae. The subgenera with three postalars (*Rutilia* s.str., *Microrutilia* and *Grapholostylum*) have a well developed anterior sternopleural seta, lack a hind tibial fringe, and have the hair of the supra-squamal ridge rather short and sparse, and are considered very closely allied; the subgenera with four postalars (or more) (*Donovanius* and *Chryсорutilia*) seem similarly close to each other (although their ♂ genitalia differ strikingly) and comprise forms without definite anterior sternopleural setae, with a well developed hind tibial fringe, and with extremely long thick bushy and often crinkled hair on the supra-squamal ridge. Distinctions between the seven subgenera recognized are emphasized in more detail in the treatment of each subgenus.

There is a strong tendency for the constituent species within each subgenus to have the same or similar type of colour pattern, though species may look superficially rather different because of different intensities of colour and of widely differing sizes. In *Rutilia* s.str. the predominant coloration is brown with little or no development of metallic colouring and no spot patterns, whereas in *Chryсорutilia* the species are rather homogeneously metallic green to blue-violet, with yellow heads and some coppery or blackish patterning or iridescence; in *Ameniamima* the colouring is green to purplish black, and both thorax and abdomen have a pattern formed of boldly marked white pollinose spots. A general indication of the range of colour and pattern, together with size, found in each subgenus has been given as an appendix to each of the subgeneric diagnoses.

The male genitalia and the form of the 5th (subgenital) abdominal sternite of the male provide some characters of taxonomic value at subgeneric and specific level, although very often groups of apparently distinct species have virtually

identical terminalia. Throughout most of the *Rutilia* s.l. species the male sternite 5 does not significantly differ from that of other Rutilini, and has a simple bilobed form (Text-figs 30 & 31), but in two aggregations of species (here treated as the subgenera *Grapholostylum* and *Microrutilia*) the sternite is atypical: in *Grapholostylum* the sternite has exceptionally pointed outer sides and has a pair of curious blunt downwardly directed protuberances near the middle (Text-fig. 33); in *Microrutilia* the sternite is also very prominent in profile when in situ but does not have the submedian prominences and has each of the lateral lobes distinctly concave on its hind margin (Text-fig. 32).

The aedeagus in *Rutilia* s.l. is remarkably constant in structure and the only character found in it of any taxonomic use lies in the distiphallus. The distal membranous part of the distiphallus is normally shorter than, or at most subequal in length to, the sclerotized proximal part (Text-fig. 37), but in the subgenus *Grapholostylum* the distal membranous part of the distiphallus is much longer than in other *Rutilia* and has a slender whip-like form which is about twice as long as the sclerotized proximal part of the distiphallus (Text-fig. 38). The form of the cerci (mesolobes) does not differ very greatly in *Rutilia* s.l. species, although some specific differences are evident, and the cerci do not provide features of subgeneric value. On the other hand the shape of the surstyli (paralobes) differs conspicuously among different subgenera, being particularly distinctive in the subgenera *Donovanius* and *Chryсорutilia*. In *Donovanius* the surstyli are very enlarged and foliaceous in form (Text-figs 66–71) (enabling males of this subgenus to be recognized immediately the genitalia are examined), and in *Chryсорutilia* the surstyli (though varied in shape) always come to a fine sharp point at the apex (Text-figs 72–84). Other subgenera are less distinctive in genital form among their included species, but they all differ from *Donovanius* and *Chryсорutilia* by having differently shaped surstyli (i.e. by having neither the enormous foliaceous surstyli like *Donovanius* nor the sharply pointed mucronate surstyli like *Chryсорutilia*).

In *Rutilia* s.l. as a whole it is often difficult, unless a species has a particularly unusual form of male hypopygium, to determine the limits of species. Many of the apparent species have genitalia that are identical or nearly identical—for example, the many distinctive-looking entities considered to be species in the subgenus *Donovanius* actually differ not at all in their male genitalia, or if there are differences they are extremely subtle and of no practical use. Some of the colour characters that have been used to separate species, for instance whether the metallic areas of the abdomen are in spots or bands, seem to be undependable criteria for they fail to correlate very often with differences in male genitalia (particularly in the subgenus *Chryсорutilia* in which some species with very distinctive genitalia show the same or a very similar range of variation in colour pattern). Furthermore it seems possible that some species are polymorphic in respect of hair colour, so that some apparent species with yellow pleural hair may not be actually distinct from those with black pleural hair; and it also appears likely that some species may have black pleural hair in males but yellow pleural hair in females (similar to the sexual dimorphism in pleural hair colour found in some species of the higher Tachinid genus *Winthemia* Robineau-Desvoidy). At the present time no firm conclusions can be drawn on



these possibilities, so specific names are maintained as valid in the present work unless the types on which they are based show complete agreement in their characters (hair colour included). In taking this approach I have perhaps erred on the side of accepting too many nominal species as valid, but in the present state of knowledge it is better to do this than to establish synonyms on inadequate evidence of conspecificity.

KEY TO THE SUBGENERA OF *RUTILIA*

[*Note*: Occasional specimens may have four postalar setae on one side and three on the other: such specimens should be run as if four setae were present on both sides. *R. micropalpis* is subgenerically unplaced and will not therefore run out in the key (it is distinguished from all other *Rutilia* s.l. by the very reduced palpi and other characters noted on p. 92).]

- 1 Parafrontals non-pollinose, brilliant metallic green to blue-violet. Postalar callus with three setae. Hind tibia without anterodorsal fringe and without definite *ad* or *pd* setae. [Eastern Australia] . . . . . **NEORUTILIA** Malloch (p. 48)
- Parafrontals pollinose, either without metallic colour or with mere trace near vertex (except in species from Philippines but then four postalar setae). Postalar callus with either three or more setae. Hind tibia either with well developed close-set anterodorsal fringe or with some well developed *ad* or *pd* setae, or with both fringe and *pd* setae. . . . . 2
- 2 Suprasquamal ridge bare and postalar callus with four or five setae. Metallic green, blue to purplish black forms with bold white pollen spots on thorax and abdomen. [Eastern Australia] . . . . . **AMENIAMIMA** subgen. n. (p. 51)
- Suprasquamal ridge haired, or if bare then only three strong setae on postalar callus. Colour and pattern varied, but if bold white pollinose spots present then either three setae only on postalar callus or parafacials haired . . . . . 3
- 3 Postalar callus with four or more strong setae. Hind tibia with an anterodorsal fringe. One sternopleural seta (0 + 1), at most only a very weak anterior sternopleural seta distinguishable among the hair. Hair of suprasquamal ridge long, dense and bushy, often crinkled and often extending on to basal depression of lower calypter . . . . . 4
- Postalar callus with three strong setae. Hind tibia without a definite anterodorsal fringe (occasional species with weakly developed or irregular fringe). Two or three sternopleural setae (1 + 1 or 2 + 1), anterior *stpl* conspicuous amongst the sternopleural hair. Hair of suprasquamal ridge rather short and sparse, not noticeably crinkled and never extending on to base of lower calypter (lower calypter always entirely bare) . . . . . 5
- 4 Last abdominal tergite (T<sub>5</sub>) with a median depression and a median transverse row of strong erect setae. ♂ genitalia with very large broad foliaceous surstyli (Text-figs 66-71) without sharp pointed tip. Scutellum usually distinctly flattened and without distinct preapical setae in front of the marginal row. Pteropleural hairing not developed in front of the level of the posterior *stpl* seta (Text-fig. 20). Inner half of humeral callus with at least a trace of humeral setae distinguishable from the hair (humeral callus usually therefore with three or four distinguishable setae even if the innermost one or two are very weak). Head with dark ground colour. [Australia, Solomon Islands to Samoa] . . . . . **DONOVANIUS** Enderlein (p. 69)
- Last abdominal tergite (T<sub>5</sub>) evenly convex across its width, without median depression or at most with only a mere trace of apicomedian hollowing; T<sub>5</sub> normally without any development of strong setae, vestiture composed only of fine erect hair (some setae present in species from Philippines, and some other species occasionally with some of the erect hair stronger than remainder). ♂ genitalia

with elongate surstyli which end in a sharp pointed tip (Text-figs 72-84). Scutellum convex and with an irregular row of small but definite horizontal preapical setae in front of the marginal setae. Pteropleuron haired on the anteroventral part in front of the level of the posterior *stpl* seta (Text-fig. 19). Inner half of humeral callus without setae developed amongst the hair (humeral callus therefore only with the two setae on the outer half). Head usually with bright yellow ground colour. [Widespread in Oriental and Australasian Regions]

**CHRYSORUTILIA** Townsend (p. 54)

- 5 Last abdominal tergite (T<sub>5</sub>) with a median depression. Abdominal T<sub>3</sub> with a transverse row of at least a few, usually many, strong erect spiniform marginal setae. Scutellum distinctly flattened or slightly hollowed before the apex. Suprasquamal ridge bare or haired. Arista micropubescent. Setae of inner ventral ends of abdominal tergites rather strong and directed downwards as well as backwards. ♂ sternite 5 with normal simple lobes. [Australia]

**RUTILIA** Robineau-Desvoidy s.str. (p. 77)

- Last abdominal tergite (T<sub>5</sub>) without a median depression, the upper surface evenly convex or at most with only a trace of flattening at the tip. Abdominal T<sub>3</sub> without a transverse row of marginal setae, or if a row present then the setae not markedly spiniform. Scutellum evenly convex on upper surface. Suprasquamal ridge haired. Arista long-pubescent to short-plumose. Marginal setae of tergite venters usually weak or hair-like and nearly completely recumbent (not projecting noticeably downwards). ♂ sternite 5 atypical, shaped either as in Text-fig. 32 or as in Text-fig. 33 . . . . . 6

- 6 ♂ sternite 5 as in Text-fig. 33, the sternite very strongly acuminate on each side and provided with a pair of submedian downwardly directed protuberances. Distal membranous part of ♂ aedeagus exceptionally long and whip-like (about twice as long as the sclerotized proximal part of distiphallus, Text-fig. 38). Only one posterior intra-alar seta (exceptionally a small second seta present in front of main one). ♀ normally without, or with one pair of, proclinate orbital setae. Thorax with distinct white pollinose areas (often forming bold white spots) over mesopleuron, sternopleuron, humeral callus and supra-alar area of scutum. [Tasmania to Queensland]

**GRAPHOLOSTYLUM** Macquart (p. 83)

- ♂ sternite 5 as in Text-fig. 32, the sternite without such acuminate sides and without a pair of submedian protuberances. Distal membranous part of ♂ aedeagus normal in size, shorter than proximal sclerotized part of distiphallus (Text-fig. 37). Normally two *post ia* setae (but only one in occasional specimens). ♀ normally with two pairs of proclinate orbital setae (occasionally one or none). Thorax without distinct white pollinosity and therefore lacking bold white spots. [Tasmania to Queensland; one undescribed species seen from New Guinea]

**MICRORUTILIA** Townsend (p. 86)

Subgenus **NEORUTILIA** Malloch

*Neorutilia* Malloch, 1936 : 17. Type-species: *Rutilia* (*Neorutilia*) *simplex* Malloch, 1936, by original designation. (As subgenus of *Rutilia* Robineau-Desvoidy, 1830).

DIAGNOSIS. Parafrontals metallic (hardly at all pollinose). Epistome metallic; genal dilations entirely metallic (trace of thin pollinosity in some lights). Facial carina flattened on outer surface, strongly contracted ('pinched-in') ventrally in ♀, not separated from lunula by distinct depression. Parafacials bare. ♀ without proclinate orbital setae. Arista bare (unusually long and slender). Humeral callus with 4-5 setae. Posthumeral setae absent in ♂, variably 2-3 in ♀ (one near inner edge of humeral callus and at least one near presutural seta). One *post ia* seta in ♂, one or two small *post ia* setae in addition to main one in ♀. Scutum with super-numerary prescutellar setae, forming in all a transverse row of about 12 very strong stiff setae

immediately before scutellum. Postalar callus with 3 strong setae. Suprasquamal ridge thickly haired. Scutellum strongly flattened, rather thin; with 7-8 pairs of marginal setae (these very strong, stiff and straight); with a row of small irregular preapical setae, these very feebly developed in ♂. Haired area of lower part of pteropleuron *not* extending in front of level of posterior sternopleural seta. One sternopleural seta (0 + 1). Prosternum and prosternal membrane bare. Hind tibia without definite anterodorsal fringe and without *ad* setae, *pd* seta absent in ♂ but one present in ♀ (latter may have very weak second *pd* setula). Last abdominal tergite broad and with large depression. T<sub>3</sub> without median or lateral marginal setae. T<sub>5</sub> with transverse median regular row of long strong erect setae. Surstyli of ♂ genitalia simple elongate lobes (Text-fig. 59). [Bright green to violaceous blue species with metallic parafrontals and genae and blackish hind margins to abdominal tergites].

**DISTRIBUTION.** Known only from eastern Australia from Victoria to Queensland.

**DISCUSSION.** Malloch erected *Neorutilia* as a subgenus of *Rutilia* for the single aberrant species *simplex* Malloch. This is a curious and isolated species showing an unusual combination of characters which prevent it from being assigned satisfactorily to any other subgenus, and I therefore agree with Malloch in placing *simplex* separately from other *Rutilia* and am recognizing *Neorutilia* as a valid subgenus; no other species fitting into the concept have been described.

The metallic blue or green parafrontals, epistome and genal dilations make *simplex* a unique species amongst the whole *Rutilia* fauna of Australia, and it is therefore very easily identified, but very similar forms superficially—having the same type of largely metallic head, similar coppery green to blue-violet body colour, and even the same knob-like development of the hind part of the notopleuron—are to be found in the *luzona*-group of *Chryсорutilia* from the Philippines. This superficial resemblance is so strong that I at first inclined to believe that *simplex* and the Philippine species referred to must have strong affinity and perhaps be consubgeneric, but detailed examination of the whole constellation of body characters shows convincingly that the resemblances are convergent. The *luzona*-group has the features of true *Chryсорutilia* such as the presence of strong hairing on the prosternal membrane and forward edge of the prosternum itself, loss or non-development of the inner setae of the humeral callus, no depression in the last abdominal tergite, extended area of hairing forwards on the lower pteropleuron, no supernumerary prescutellar setae, four or more postalar setae, convex scutellum, and long regular hind tibial fringe: in *simplex*, however, these characters of *Chryсорutilia* are not found, and *Neorutilia* differs from *Chryсорutilia* by having bare parafacials, bare prosternal membrane and prosternum, inner humeral setae developed, strong supernumerary prescutellars developed, only three postalar setae, extremely flattened scutellum, pteropleural hairing not extending forwards of the sternopleural seta, no hind tibial fringe (or extremely short and inconspicuous), and a well developed depression in T<sub>5</sub>.

In several of the characters just cited *Neorutilia* resembles the subgenus *Donovanius*—for example both subgenera have setae on the inner part of the humeral callus, lack pteropleural hair anterior to the sternopleural seta, have a very broad abdominal T<sub>5</sub> with large median depression, and have the scutellum distinctly flattened—but it is doubtful whether there is any close relationship between the two. *Neorutilia* differs from *Donovanius* in having only three postalar setae, largely



metallic head, only one *stpl* seta and no hind tibial fringe; the hairing of the suprasquamal ridge is also much longer, more bushy and crinkly, than in *Donovanius* (in which respect *Neorutilia* agrees with *Chryсорutilia*). The hairing of the suprasquamal ridge at once separates *Neorutilia* from *Ameniamima* subgen. n., from which it also differs by the pteropleural character, the metallic head, the three postalars, the lack of white pollinose spots, the flattened scutellum and the supernumerary prescutellar setae.

In *simplex* the presence of very strong supernumerary setae on the scutum immediately in front of the scutellum is a striking feature; it is difficult to distinguish which actual setae are the supernumeraries and which are the true hindmost setae of the dorsocentral and acrostichal rows, for together the setae (which are all unusually strong, rather straight and thick) form a transverse row of more or less homogeneous setae (very much resembling then the transverse rows of prescutellar setae formed in a similar way in many species of *Formosia* or in occasional species of *Rutilia* (*Donovanius*) such as *sabrata* (Walker)). Development of such supernumerary prescutellars appears to occur rather haphazardly in unrelated groups of Rutiliines.

It does not seem likely that *Neorutilia* has any close relationship with the other subgenera possessing only three postalar setae, *Rutilia* s.str., *Grapholostylum*, and *Microrutilia*, for apart from this character and the lack of the hind tibial fringe it has little in common with these subgenera, differing from them greatly in general appearance, metallic head, one *stpl* seta, flattened scutellum, supernumerary prescutellar setae, and the long thick suprasquamal hairing (in contradistinction to the rather short sparse ridge hairing found in *Rutilia* s.str. or *Grapholostylum*).

Apart from the characters cited in the diagnosis and discussed comparatively above there are some other curious features found in *simplex* that require comment. The facial carina seems, from the small number of specimens so far available, to be unusually sexually dimorphic, being much longer and more strongly pinched-in towards the lower end in the female than in the male, and the antennae of the female to be correspondingly longer than those of the male. There is also something 'different' about the facies of the head when seen in facial view that is hard to define in words or to figure satisfactorily but is associated with the fact that the lower ends of the facial ridges are more flattened than is usual in *Rutilia* s.l. and more extensively haired; normally in *Rutilia* there are only one or two irregular series of hairs on the facials laterad and ventrad of the main vibrissae, but in *simplex* there are some three or four irregular series of rather small hairs. Another unusual feature is the nature of the arista, which is exceptionally long and fine and is virtually totally bare; in all other *Rutilia* the arista is obviously more thickened on much of its length and is always conspicuously pubescent or sometimes even short-plumose. The claws are shorter than in most other species of the genus, and the fore tarsi are shorter than in all other species. Malloch (1936) pointed out in the original definition of *Neorutilia* and description of *simplex* that the section of the costa between the apex of the subcosta and the first vein (second costal sector) is subequal in length to the section between the apex of the first vein and apex of the second vein (third costal sector), and remarked that he had not seen other species with similar costal

divisions. Although I have not used this feature in the subgeneric diagnoses, it is true of all material that I have seen that the second and third costal sectors in *simplex* are subequal in length whereas in all other *Rutilia* the second sector is obviously appreciably shorter and often very much shorter than the third sector; certainly this is one of the characters along with the others already alluded to that make *simplex* a very atypical *Rutilia*, and one best placed in a separate subgenus.

#### INCLUDED SPECIES

*Rutilia (Neorutilia) simplex* Malloch. AUSTRALIA (New South Wales, Queensland, Victoria). [Holotype examined].

#### Subgenus *AMENIAMIMA* subgen. n.

Type-species: *Rutilia argentifera* Bigot, 1874.

DIAGNOSIS. Parafrontals thickly pollinose. Epistome not metallic, genal dilations thickly pollinose. Facial carina flattened on anterior surface, sides subparallel or slightly widened near base of third antennal segment, not separated from lunula by distinct depression; epistome rather strongly prominent. Parafacials bare. ♀ without proclinate orbital setae or with one pair. Arista pubescent. Humeral callus with 3-4 setae, innermost one well developed (especially in ♀). Posthumeral setae usually absent in ♂ or one distinguishable from hair near inner edge of humeral callus, 2-4 rather strong but irregular in ♀ (if more than two then one of the *ph* standing near to presutural seta). One or two *post ia* setae. Scutum without super-numerary prescutellar setae. Postalar callus with 4-5 strong setae. Suprasquamal ridge bare. Scutellum not flattened, dorsal surface evenly convex; with 3-6 pairs of marginal setae (these not stiffened); marginal setae preceded by irregular row of distinct preapical setae (very well differentiated from scutellar hairing). Haired area of lower part of pteropleuron extending well forwards of the posterior *stpl* seta. Normally two sternopleural setae (1 + 1), anterior one weak in ♂ and sometimes not differentiated in this sex (aberrant ♀ specimen seen with doubled posterior *stpl*). Prosternum and prosternal membrane bare. Hind tibia without definite anterodorsal fringe and with one submedian *ad* seta (except in *cingulata* ♂ which has moderately developed regular *ad* fringe), with one or two *pd* setae. Last abdominal tergite (T5) with a very small median apical depression in ♂ (not longer than half tergite length at most) and without any definite apical depression in ♀. T3 without median marginal setae (occasionally a few developed in ♀) and with lateral marginal setae. T5 with a transverse row of long strong erect setae on apical half, sometimes whole posterior half of T5 in ♂ bristled with many very long strong irregularly arranged setae. Surstyli of ♂ genitalia in form of broad lobes (Text-fig. 58). [Bright green, cupreous, or blue to purplish black forms with bright orange-yellow heads, and discrete bold white pollinose spots on thorax and abdomen, showing strong resemblance to calliphorid flies of genus *Amenia* Robineau-Desvoidy].

DISTRIBUTION. Australia only, from Victoria to Queensland (not seen from Western Australia, South Australia, or Tasmania).

DISCUSSION. The new subgenus *Ameniamima* is here erected for a small group of eastern Australian species of *Rutilia* s.l. which show a quite remarkable convergent resemblance in body form, colour and pattern, to flies of the Australian genus *Amenia* Robineau-Desvoidy (Calliphoridae). Four nominal species of this group have been described, but each is known from only very little material and it is not certain that all four names actually denote distinct species; one is here placed as a new synonym.

*Ameniamima* includes all the species of *Rutilia* s.l. in which the suprasquamal ridge is bare and there are more than three postalar setae (elsewhere in *Rutilia* s.l. the few species with bare ridge have only three postalar setae). The metallic green or blue colouring that is typical in *Ameniamima*, combined with the bright orange-yellow head, give the species a superficial resemblance to some *Chryсорutilia* species, and it is possible that it is to this latter subgenus that *Ameniamima* is most closely related; the two subgenera share such features as the presence of four or five postalar setae, the haired area of the lower pteropleuron extending well forwards of the level of the posterior sternopleural seta, the presence of a definite irregular transverse row of semi-horizontal preapical scutellar setae in front of the marginals, similar general shape of facial carina, and similar lack of a definite median depression in the last abdominal tergite (though a small depression is present at the tip of the tergite in *Ameniamima* males). The main differences between *Ameniamima* and *Chryсорutilia*, apart from the bare suprasquamal ridge in the former and densely haired ridge in the latter, include the following: parafacials, prosternum and prosternal membrane bare in *Ameniamima* (partly or entirely haired in *Chryсорutilia*); inner half of humeral callus with one or two humeral setae developed in addition to the pair on the outer half of the callus in *Ameniamima* (only the outer pair present in *Chryсорutilia*); hind tibia usually without definite fringe in *Ameniamima* (with long close-set regular fringe in *Chryсорutilia*); abdominal T5 with long strong setae in *Ameniamima* (only with fine hairing in *Chryсорutilia*, except for some weak erect bristling in Philippine forms). In addition the chaetotaxy is generally much stronger in *Ameniamima* than in *Chryсорutilia*, especially the bristling of the mesonotum, the outermost humeral setae, and the posterodorsal setae of the hind tibia. The head of *Ameniamima* species is almost entirely thickly yellow pollinose over the yellow ground colour, only the extreme upper parts of the occiput being bare or metallic, and the completely pollinose genal dilations and postbuccae will at once distinguish specimens of the subgenus from *Chryсорutilia* (in which all species have these areas of the head largely bare or metallic and at most only thinly pollinose).

The body colour in *Ameniamima* ranges from brilliant metallic green (sometimes with brassy or coppery tinge) to blue, violet and purplish black; in one species, *cingulata*, the colour is virtually black except for violet tinges near the pollinose spots and metallic silvery blue colour underlying a thick whitish pollinosity on abdominal T3. All the species possess well developed, conspicuous and rather discrete, spots of thick white pollinosity, those of the abdomen having a slightly shifting appearance with the light. The spot pattern consists of paired white spots in these positions: humeral; supra-alar; mesopleural; sternopleural; ventrolateral on abdominal T3, T4, and T5; dorsolateral on T3; submedian on T4 and T5. In addition there is usually a pair of submedian white pollinose vittae variously developed on the prescutum, and in a few specimens (including the lectotype of *argentiifera*) there is a trace of an evanescent pair of submedian spots on T3. Usually the dorsolateral spots of T3 and the submedian spots of T5 are more or less merged with the ventrolateral spots of their respective tergites. In the male of *cingulata*, which conforms to the basic plan of the pattern, the supra-alar spots and the submedian spots of T4 and T5 are rather small but the white pollinosity is so extensively developed on



the ventrolateral and dorsal parts of T<sub>3</sub> that it forms an almost complete band around the whole of this tergite and in dorsal view completely conceals the metallic blue ground colour of this tergite.

A white-spotted pattern of the type just described does not occur in quite the same way in other subgenera of *Rutilia* s.l., although some of these contain individual species in which there is some development of a white-spot pattern with a superficial resemblance to that of *Ameniamima*, for example an undescribed species of subgenus *Chrysorutilia* in which the thoracic spotting is the same except for lack of definite sternopleural spots and in which the abdomen has ten small sharply-defined silvery white spots on a purplish black background (four spots in a transverse row on each intermediate tergite, and paired lunate spots on the last tergite); two species of *Grapholostylum* have a pattern of whitish spots, viz. *albovirida* Malloch and *dorsomaculata* (Macquart), but in these species there are *ventral* spots or pollinose areas on the tergites and a pair of submedian spots on the scutum which are not found in *Ameniamima*. The resemblance, however, between the spot-pattern of *Ameniamima* and of the Calliphorid fly genus *Amenia* is extraordinarily exact, and the former name here proposed for a subgenus of *Rutilia* alludes to this fact as well as to the other many similarities by which *Ameniamima* counterfeits *Amenia*.

The astonishing convergent resemblance between Rutiliini and Ameniinae (Calliphoridae) was already recognized in an inchoate way as early as 1830, when (as Crosskey (1965 : 41) has pointed out) Robineau-Desvoidy realised that it was by an error that he had placed the Ameniine species *Amenia leonina* (Fabricius) in *Rutilia* when the latter was first described. Since then several workers have commented on the resemblance and some have been misled into uniting the Ameniines with the Rutiliines, mainly because of the common possession of a large facial carina and the same range of colour and pattern; Enderlein (1936) named the Ameniine genus *Formosiomima* for a species seemingly mimicking the black-and-white pattern of *Formosia speciosa* (Erichson). It is now established beyond any doubt that the Ameniines, with their Calliphorid type of male genitalia (completely unlike the Prosenine Tachinid genitalia with the extraordinarily elongate slender aedeagus) and other Calliphorid characteristics are not Tachinidae (see Crosskey (1965)), and hence that the resemblances are due to convergence. These resemblances reach their apogee amongst the species of *Rutilia* here placed in the subgenus *Ameniamima* and in the species of *Amenia* Robineau-Desvoidy, in which it almost seems as though individual species have their respective counterparts: bright green specimens of *R. (A.) argentifera* have their counterpart in *Amenia imperialis* R.-D., while *R. (A.) quadripunctata* (Malloch), which is often more blue, resembles *Amenia leonina* (Fab.). However, all the *Amenia* species have a pair of silvery white pollinose spots in a postalar position (partly overlying the postalar callus and partly the hind scutal border) which are always absent in *Rutilia* s.l.

Three of the nominal species included in the present subgenus were placed by Malloch (1929, 1930) when originally described in the genus *Formosia* because of the bare suprasquamal ridge, a character which Malloch rather rigidly regarded as absolutely dependable for separating *Formosia* from *Rutilia*; reliance on this character alone induced Malloch to place the three 'bare ridge' species here included, and

also *confusa* Malloch (a species of *Rutilia* s.str. with bare suprasquamal ridge), out of *Rutilia* to which they so obviously fit well on the total facies provided by all their other characters and into *Formosia* (with which, apart from the bare ridge, they have little in common). The oversimplified picture provided by Malloch's conception of two genera *Formosia* and *Rutilia* always clearly separable by the ridge vestiture character is not justified when all characters are correlated, and the species here forming the subgenus *Ameniamima* are considered in this revision to belong to *Rutilia* s.l. in spite of the exceptional feature of lacking hair on the suprasquamal ridge.

Note should be made here of Malloch's (1928a : 333; 1929 : 297; 1930 : 107) misidentification of *Rutilia argentifera* Bigot. The true *argentifera* Bigot with bare prosternal membrane, bare parafacials and bare suprasquamal ridge, is the species here designated as type-species of *Ameniamima* subgen. n. and is not the species called *argentifera* by Malloch (who did not see Bigot's types and whose citations given above to this species are all based on misidentifications). Malloch's species to which he applied Bigot's name has the prosternum hairy (see Malloch's 1928a : 333 key) and the parafacials haired (Malloch 1929 : 297-298), and also has the suprasquamal ridge hairy (otherwise he would have placed it in *Formosia*), and is clearly a species of the subgenus *Chryсорutilia*.

#### INCLUDED SPECIES

- Rutilia (Ameniamima) argentifera*** Bigot. AUSTRALIA (New South Wales, Queensland). [Lectotype examined].  
*frontosa* (Malloch) **syn. n.** [Holotype examined].  
***R. (A.) cingulata*** (Malloch). AUSTRALIA (New South Wales). [Holotype examined].  
***R. (A.) quadripunctata*** (Malloch) **comb. n.** AUSTRALIA (Queensland, Victoria). [Holotype examined].

#### KEY TO SPECIES OF THE SUBGENUS *AMENIAMIMA*

- 1 Postorbites entirely bright yellow pollinose and concolorous with rest of the yellow head. ♂ surstyli as in Text-fig. 58 . . . . . ***R. argentifera***  
 - Upper two-thirds of the postorbites silvery white pollinose and contrasting in colour with rest of the yellow head. [Genitalia of ♂ not examined] . . . . . 2  
 2 Third abdominal tergite (i.e. apparent second segment) almost completely covered with dense white pollinosity, so that abdomen shows a broad pale transverse sub-basal band which strikingly contrasts with remainder of dark abdomen (silvery bluish glints visible through the pollinosity in some lights). General body colour dark purplish black with very dark brown non-metallic scutellum. [Known only from ♂ holotype, ♀ may not conform] . . . . . ***R. cingulata***  
 - Third abdominal tergite not so, with only two small inconspicuous spots of whitish pollinosity with shifting appearance on each side, T<sub>3</sub> therefore appearing unicolorous with rest of abdomen. General body colour blue-green to deep violet-blue, scutellum distinctly metallic . . . . . ***R. quadripunctata***

#### Subgenus ***CHRYSORUTILIA*** Townsend **stat. n.**

*Chryсорutilia* Townsend, 1915 : 23. Type-species: *Rutilia formosa* Robineau-Desvoidy, 1830, by original designation.

- Philippoformosia* Townsend, 1927 : 282. Type-species: *Philippoformosia splendida* Townsend, 1927 [= *townsendi* Crosskey, **nom. n.**], by original designation. **Syn. n.**
- Habrota* Enderlein, 1936 : 399. Type-species: *Rutilia formosa* Robineau-Desvoidy, 1830, by original designation. [Isogenotypic name with *Chryсорutilia* Townsend].
- Zoramisceus* Enderlein, 1936 : 416. Type-species: *Rutilia erichsonii* Engel, 1925 [= *Dexia chersipho* Walker, 1849], by original designation. **Syn. n.**
- Idania* Enderlein, 1936 : 408. Type-species: *Idania atrox* Enderlein, 1936, by original designation. **Syn. n.**
- Formotilia* Paramonov, 1968 : 355. [Name published in footnote to generic key: unavailable under Article 13 (b) of *International Code of Zoological Nomenclature*, no fixation of type-species.]

**DIAGNOSIS.** Parafrontals pollinose (except *luzona*-group and *atrox*). Epistome not metallic (except *luzona*-group). Genae with the dilations partly or entirely metallic, without or with very thin pollinosity (golden green to blue, except dark brown in *atrox*). Facial carina conspicuously flattened on anterior surface, sides subparallel or slightly divergent ventrally, separated from lunula by weak depression. Parafacials haired. ♀ without proclinate orbital setae. Arista micropubescent. Humeral setae reduced, 2 on outer half of callus only (at most only minute hair-like inner humerals developed). Posthumeral setae absent. *Post ia* setae normally one each side, occasionally absent (rarely two in ♀). Scutum without supernumerary prescutellar setae. Postalar callus with 4-6 strong setae. Suprasquamal ridge thickly haired. Scutellum not flattened or at most with only slight flattening at apex; with 4-7 pairs of marginal setae (these rarely stiffened); marginal setae preceded by an irregular row of horizontal preapical setae clearly differentiated from scutellar hair. Haired area of lower part of pteropleuron extending well forwards of the posterior *stpl* seta. One sternopleural seta (0 + 1), sometimes one or two small wiry anterior sternopleurals developed in ♀; rarely sternopleurals quite absent. Prosternum haired on anterolateral corners; prosternal membrane haired (hair often long and conspicuous). Hind tibia with long regular anterodorsal fringe (no evident *ad* setae), without or with one or two very weak *pd* setae. Last abdominal tergite (T5) without median depression, convex on upper surface. T3 without median marginal setae (rarely weak setae present in ♀) and without lateral marginals. T5 with fine erect hair only (sometimes some more strongly developed slightly setiform vestiture at apex; irregular erect stubby setae in *luzona* ♂). Sternite 5 of ♂ with simple rounded lobes. ♂ genitalia with distal membranous part of distiphallus shorter than, or at most subequal in length to, the sclerotized proximal part; surstyli much longer than wider, sometimes with blunt projection or long tooth anteromedially, always with sharp pointed tip that is directed more or less forwards (Text-figs 72-84). [Mainly metallic golden-green, coppery, or blue-green forms with banded or spotted abdomen and yellow head ground colour, often with white pollinose areas on thorax but these very rarely forming bold discrete spots.]

**DISTRIBUTION.** Widespread throughout Oriental and Australasian regions, the distribution including Ceylon, India, Vietnam, Philippines, Timor, Western Australia (including Monte Bello Islands), all of eastern Australia and Tasmania, the Kei Islands, New Hebrides and Lord Howe Island.

**DISCUSSION.** *Chryсорutilia* is the largest subgenus of *Rutilia* s.l. and has a wider geographical distribution than any other subgenus; it includes some two-fifths of the described species (though some of the names accepted as valid might prove to be synonyms) and is the only segregate of *Rutilia* s.l. represented on the mainland of Asia. The subgenus is poor in number of species in the Oriental Region, and those that do exist in this area appear to be uncommon to judge from the paucity of specimens in museum collections; the occurrence of the subgenus in Asia appears to be due to dispersal from a centre of evolution in Australia, and the forms found



in the New Hebrides and Lord Howe Island (whose specific identities are doubtful at present) probably also reached these locales from Australia itself.

The subgenus is perhaps better characterized than the other subgenera and there is usually no difficulty in deciding whether any described species does or does not fit into *Chrysorutilia*. The subgenus includes all the *Rutilia* species that have bright yellow heads and hairy parafacials, and it is a useful rule-of-thumb that specimens showing these characteristics in combination must belong to species of *Chrysorutilia*; however, there are a few species which evidently belong in this subgenus in which the head is not bright yellow (even *formosa*, the type-species, has the head colour slightly brownish rather than yellow) and a few very curious forms from the Philippines in which the body is entirely blackish brown (*atrox* Enderlein) or in which the parafrontals are bare and brilliant metallic green or blue (*luzona* Enderlein and *splendida* Townsend). These Philippine species are discussed further below, as two of them are type-species of generic names which are here treated as synonyms of *Chrysorutilia*.

The characteristics which separate *Chrysorutilia* from *Donovanius* and *Ameniamima* are discussed in the treatments of these subgenera and need not be detailed here, but some unusual features of *Chrysorutilia* are worthy of special note. A curious character of the subgenus is the unusually long and conspicuous hair to be found on the membranous areas of the prosternal region, and anteriorly on the edge of the prosternal plate itself; hair on the membrane occurs in many *Donovanius* species and occasionally in *Grapholostylum*, but in these subgenera is usually sparse and not very obvious, while they never have hair actually on the edge of the prosternum, whereas in *Chrysorutilia* both membrane and plate bear hair and that on the membrane is sometimes strong and black and immediately obvious (providing the head of the specimen is set forward sufficiently clear of the lower thorax). Prosternal membrane hair of this strong black type occurs on the types of *Idania atrox* (type of *Idania*) and *Philippoformosia splendida* Townsend (type of *Philippoformosia*), and conformity of this character (as well as other essential features) suggests that these Philippine species should be treated as consubgeneric with typical *Chrysorutilia*; hence *Idania* and *Philippoformosia* are here placed as new synonyms of *Chrysorutilia*.

*Idania* and *Philippoformosia* agree, too, with *Chrysorutilia* in other essential features of the subgenus such as the rounded non-sulcate last abdominal tergite, the haired area of the pteropleuron extending well forwards of the posterior sternopleural seta, the weak development of humeral setae (only two setae on the outer half of the callus), the total lack of posthumeral setae, the extremely well developed hind tibial fringe, the very bushy tuft of rather long crinkly hair on the suprasquamal ridge, and the presence of distinct preapical setae on the scutellum just in front of the marginals. However, there are some obvious minor differences between the Philippine species and typical *Chrysorutilia* and they are here placed in separate species-groups from the main bulk of the species; the groups are keyed out and defined immediately after this discussion section.

Hairing of the suprasquamal ridge is developed to its greatest extent among the Rutiliini in this subgenus. In all *Chrysorutilia* species the hair of the ridge is very

long and dense and forms a very conspicuous bushy tuft in which the individual hairs are often rather crinkled apically (Text-fig. 24); in some of the species the hairiness extends on to the base of the lower calypter. Hairing of the lower calypter occurs, so far as I know, nowhere else in the Rutiliini, but as it is not at all consistent throughout *Chrysorutilia* it has not been cited as a character either in the subgeneric key or the diagnosis; nevertheless it can be a useful feature in recognizing, or helping to distinguish, some species. In the smaller species of *Chrysorutilia* the lower calypter is usually completely bare or has only a very few hairs at the extreme base adjacent to the suprasquamal ridge, but in some of the larger species such as *R. (C.) splendida* (Donovan) the whole basal depression of the calypter has conspicuous erect dark hair on the upper surface; in *R. (C.) cryptica* sp. n. half the surface of the lower calypter or more is hairy.

In *Chrysorutilia* the genal dilations of the head are much more extensively metallic, because they are only very thinly pollinose or because they are bare, than in the other subgenera; in other *Rutilia* s.l. the lower parts of the head are thickly pollinose (except in *Neorutilia*) and only the postbuccal regions at most have any trace of metallic colouring. In *Chrysorutilia* at least the posterior half and sometimes the whole of the genal dilation is shining golden green, cupreous, blue-green or blue-violet, at least in some lights. In the *luzona*-group even the epistome is largely shining golden green to steely blue and only very thinly pollinose, and there are bare shining parafrontals. Hairing of the parafacials is more developed than in other *Rutilia* s.l., and the males of many *Chrysorutilia* species have specially dense hair which reaches to the bottom end of the parafacials, to a point about level with the bottom-most point of the eye seen in profile; when hairy parafacials occur in other subgenera the hairing normally does not reach so far down on the parafacials. The facial carina in *Rutilia* s.l. reaches its most wide and flattened condition in *Chrysorutilia*, with the result that the antennae in this subgenus tend to be distinctly more widely separated at their insertions than is normally the case in other forms; normally the carina is exceptionally parallel-sided, tending not to widen at a level with the base of the third antennal segment as in other subgenera, and often it even widens noticeably towards the ventral end.

Three species-groups are recognized in *Chrysorutilia* and can be distinguished by the following key:

KEY TO THE SPECIES-GROUPS OF *CHRYSORUTILIA*

- 1 Body extensively metallic, gold-green or cupreous to blue-violet . . . . . 2
- Body uniformly blackish brown, not metallic, at most only slight trace of purplish tinge on abdomen. [Philippines] . . . . . *atrox*-group (p. 58)
- 2 Parafrontals and epistome metallic. Two posterior notopleural setae on unusually strongly developed (almost knob-like) protuberance. [Philippines] *luzona*-group (p. 58)
- Parafrontals and epistome not metallic. Notopleuron normal, with one posterior seta and hind part of notopleuron only slightly protuberant. [Not known from Philippines] . . . . . *formosa*-group (p. 59)

THE *ATROX*-GROUP

DIAGNOSIS. Body blackish brown with at most only very faintest metallic purplish tinge on abdominal tergites. Parafrontals non-pollinose, but not metallic. ♂ claws rather short and thick. [Character of notopleural setae uncertain, one posterior seta on one side and two on other in *atrox* holotype, only specimen known.] Last abdominal tergite with preapical transverse row of fine long erect setae differentiated from the hair.

This group contains only one species which Enderlein (1936) made the type-species of his genus *Idania*. Though this species, *atrox*, is strikingly different from all other *Chryсорutilia* because of the unicolorous dark mahogany-brown to blackish brown colouring it agrees in all its essential features with the more typical species of *Chryсорutilia* and I unhesitatingly place it in this subgenus (*Idania* thus sinking as a synonym). At present, only the holotype of *atrox* is known; in some lights the specimen shows very faint traces of purple on the abdomen, and the genae and parafrontals—although brown and non-metallic—are seen to be devoid of definite pollinosity (*atrox* in this respect resembling *luzona*-group). The holotype shows extremely well developed long black hair on the prosternal membrane and some shorter fine hairs on the front of the prosternum, much as in *luzona*-group, and the hind tibial fringe is extremely well developed; it is a large specimen measuring some 20 mm in length with slightly infusate wings in which the veins of the middle region, especially anteriorly, are conspicuously yellow. It is possible that intermediate forms will ultimately be discovered which interconnect *atrox* with the *luzona*-group, in which case the two groups could be merged under the latter name; at present both groups are found only in the Philippines, an area from which typical *Chryсорutilia* species (*formosa*-group) are not yet known.

## INCLUDED SPECIES

*Rutilia (Chryсорutilia) atrox* (Enderlein) **comb. n.** PHILIPPINES. [Holotype examined].

THE *LUZONA*-GROUP

DIAGNOSIS. Body largely golden green to dark blue; parafrontals, epistome and genal dilations metallic. ♂ claws rather short and thick. Notopleuron with posterior part extraordinarily protuberant and with two setae (notopleuron therefore with total of three setae). Last abdominal tergite with transverse preapical row of long setae differentiated from the hair.

It is to this group that Townsend (1927) applied the name *Philippiformosia*, a genus based on *splendida* Townsend from the Philippines. As with *atrox* (above), it seems to be that *splendida* Townsend has all the main characters shown by *Chryсорutilia* and I therefore place the generic name based upon it as a synonym; however, *splendida* together with *luzona* Enderlein differs from typical *Chryсорutilia* by the features mentioned in the diagnosis above and separate species-group status within *Chryсорutilia* is considered to be the most appropriate taxonomic treatment. Unfortunately *splendida* Townsend is known only from the female holotype and *luzona* only from the male holotype, and it is therefore difficult to be certain whether two distinct species actually occur; *luzona* should perhaps be placed as a synonym of *splendida* Townsend, but for the present it appears best to maintain the names for



valid species pending more evidence. The name *splendida* Townsend, being herein applied to a species of *Rutilia* s.l., becomes a junior secondary homonym of *R. splendida* (Donovan), and the name *townsendi* is therefore here proposed for the pre-occupied *splendida* Townsend (the new name will enter synonymy with *luzona* Enderlein if it is later shown that the types of *splendida* Townsend and *luzona* Enderlein are conspecific).

The BMNH collection contains two females of this group in rather bad condition that were formerly in Bigot's collection and are from an unknown locality (though Philippines seems probable). These females were the specimens for which the late Dr Paramonov had intended formally to erect the genus *Formotilia*, and which were the basis for the entry 'gen.nov. No. 2' and the footnote giving the published name *Formotilia* in his posthumous paper (Paramonov, 1968); one of the specimens bears a name label in Paramonov's writing on which the generic name *Formotilia* is given. This name, though published, is unavailable in nomenclature (no fixation of a type-species), but the existence of the specimens in BMNH which were seen and labelled by Paramonov enables the name *Formotilia* to be placed. It clearly applies to the *luzona*-group here defined and if ever validated nomenclaturally would be a synonym of *Philippiformosia*.

#### INCLUDED SPECIES

*Rutilia (Chrysorutilia) luzona* (Enderlein) **comb. n.** PHILIPPINES. [Holotype examined].

*R. (C.) townsendi* **nom. n.** PHILIPPINES. [Holotype of *splendida* examined].  
*splendida* (Townsend) [Junior secondary homonym in *Rutilia*].

#### THE FORMOSA-GROUP

**DIAGNOSIS.** Body partly or largely metallic, golden green to blue violet; parafrontals and epistome not metallic, genal dilations partly or largely but not completely metallic. ♂ claws long and slender. Notopleuron normal, posterior part not exceptionally protuberant and with one seta. Last abdominal tergite with fine erect hairing only, hair scarcely ever differentiated into any definite erect setae.

This group contains all the *Chrysorutilia* species except for those few forms from the Philippine Islands already discussed above; the *formosa*-group seems to be absent from the Philippines and replaced there by the *atrox* and *luzona* groups, in which there has been more extensive development of the bare or metallic areas of the head, reduction of the male claws, and the development of some definite setae among the hair of the last abdominal tergite (and also usually a doubling of the posterior notopleural seta together with some exceptional swelling of the hind part of the notopleuron itself). In the *formosa*-group there are always only the normal two notopleural setae (anterior and posterior), the parafrontals are thickly pollinose, and the genal dilations (though partly metallic) are dull and thinly pollinose at least anteriorly.

The concept of this group and of the subgenus *Chrysorutilia* as a whole rests nomenclaturally on the identity of *Rutilia formosa* Robineau-Desvoidy, of which the original material is lost. When Townsend (1915) erected the genus *Chrysorutilia*

he cited no characters for it, but based it upon the nominal species *R. formosa* R.-D., for which a neotype is herein designated. As Townsend (1915) cited no characters of *formosa* it is herein presumed that no conflict exists between *formosa* R.-D. as here fixed by neotype (which equals *formosa* in Malloch's and Enderlein's sense) and Townsend's *original* meaning of this name. For further discussion of this see under neotype designation for *R. formosa* on p. 124.

The limits of species in this group are often very uncertain. Some apparently distinct species which possess external pattern differences or differences of hair colour have male genitalia that differ but slightly or not at all. On the other hand, some very distinctive shapes occur in the male genitalia, especially in the shape of the surstyli, and where unusual surstylus shapes occur they appear to be constant and to define discrete species (for example, the bizarre shape of the surstylus in *R. cryptica* sp.n. is unmistakable and constant). In the past species have usually been founded on observed differences in external colour and pattern without regard to genital characters, and names have been bestowed on supposed 'species' in which the abdomen shows continuous transverse bands across the tergites and other names given to 'species' in which the tergite pattern is formed of completely or partially isolated spots. It has been found in the course of the present work that in many of the *Chrysurutilia* species there is little or no correlation between the male genital characters and the presence or absence of banded or spotted patterns. By removing the genitalia of a large number of male specimens of *R. (C.) splendida* (as this species was previously understood) it has been found that three species have been confused under this name which are easily recognized by constantly different shapes of the male surstyli: in the commonest one (for which the name *splendida* is fixed by neotype) the surstylus is simple in lateral and posterior view, having no trace of an anteromedian process (Text-fig. 72); in the second species (for which the name *decora* is fixed by neotype) the surstylus has a characteristic blunt swelling anteromedially which is just visible in posterior view (Text-fig. 73); and in the third species (which in the absence of an available name is here newly described as *cryptica*) the surstylus is produced anteromedially into an enormous forwardly directed tooth and is strongly excavate and acuminate between this tooth and its apex (Text-fig. 74) (the large tooth is very conspicuous in posterior view also). There is only a weak correlation in these three species between the genital form and the spot-pattern or band-pattern of the abdomen: in *splendida* the abdomen is usually banded but may have the bands broken into discrete spots, in *decora* the abdomen usually has discrete spots but may occasionally have continuous bands on one or both of the intermediate tergites, and in *cryptica* the pattern is similar to *decora* (most often spotted but banded specimens occurring).

Another example of more than one species confused under a single name is that of *R. (C.) imperialis*. When males of this 'species' were examined for the present work it was found that their genitalia had two distinct forms: in one the surstylus has a blunt anteromedian projection (similar to that of *decora*) and the cerci are rather slender in profile with the tips bent slightly forwards (Text-fig. 75); in the other the surstylus is much narrower and has no anteromedian projection, and the cerci in profile are broad medially with a rather sudden contraction before the rather straight

apical part (Text-fig. 76). These differences appear to be constant, and to define two semi-sibling species, which cannot be differentiated on their external characteristics. The original type-material of *imperialis* is lost and a neotype herein designated fixes the name to the species with the genital form shown in Text-fig. 75.

The existence of species which can only reliably be separated by male genitalia makes the determination of females rather hazardous, and it is not always possible to make completely dependable associations of males with females. As some of the primary types of described species are males and others females it is possible that more of the names are synonyms than are given in the list of included species which follows. Furthermore it is not yet clear whether pleural hair colour can be sexually dimorphic in any species, or whether hair colour can be variously black or yellow in the same sex in any species. At present black-haired and yellow-haired forms are assumed to appertain to different species, but this assumption may not be substantiated in future when better criteria can be found for determining what is a species than we have at present (at least it appears, so far, that a distinctive form of male genitalia is correlated with a particular hair colour).

## INCLUDED SPECIES

- Rutilia (Chrysorutilia) caeruleata* (Enderlein) **comb. n.** AUSTRALIA (Western Australia). [Lectotype examined.]  
*lineata* (Enderlein) **syn. n.** [Lectotype examined.]
- R. (C.) caesia* (Enderlein) **comb. n.** AUSTRALIA (Northern Territory, Queensland, Western Australia). [Lectotype examined.]  
*rufibarbis* (Enderlein) **syn. n.** [Lectotype examined.]  
*viridescens* (Enderlein). [Holotype examined.]
- R. (C.) chersipho* (Walker) **comb. n.** AUSTRALIA (Western Australia). [Neotype examined.]  
*erichsonii* Engel **syn. n.** [Lectotype examined.]
- R. (C.) corona* Curran. AUSTRALIA (New South Wales). [Holotype examined.]
- R. (C.) cryptica* Crosskey **sp. n.** AUSTRALIA (New South Wales, South Australia, Victoria). [Holotype examined.]
- R. (C.) decora* Guérin-Méneville. AUSTRALIA (Tasmania to Queensland). [Neotype examined.]
- R. (C.) formosa* Robineau-Desvoidy. AUSTRALIA (A.C.T., New South Wales, Victoria). [Neotype examined.]  
*pubicollis* Thomson **syn. n.** [Lectotype examined.]  
*subvittata* Malloch.  
*uzita* (Walker) **syn. n.** [Holotype examined.]
- R. (C.) goerlingiana* (Enderlein) **comb. n.** AUSTRALIA (Western Australia). [Lectotype examined.]
- R. (C.) idesa* (Walker). AUSTRALIA (? state). [Holotype examined.]
- R. (C.) imperialis* Guérin-Méneville. AUSTRALIA (Tasmania to Queensland). [Neotype examined.]  
*ruficornis* Bigot **syn. n.** [Holotype examined.]  
*semifulva* Bigot **syn. n.** [Lectotype examined.]



- R. (C.) imperialoides* Crosskey **sp. n.** AUSTRALIA (Victoria to Queensland).  
[Holotype examined].
- R. (C.) nana* (Enderlein) **comb. n.** KAI [= KEI] ISLANDS. [Holotype examined.]
- R. (C.) panthea* (Walker). AUSTRALIA (South Australia, Western Australia).  
[Holotype examined].
- R. (C.) rubriceps* Macquart. AUSTRALIA (Queensland, ? Tasmania), CEYLON,  
INDIA, VIETNAM, BURU, ? TIMOR. [Holotype examined].
- angustigena* (Enderlein) **syn. n.** [Lectotype examined].
- serena* (Walker) **syn. n.** [Neotype examined].
- nitens* Macquart. [Holotype examined].
- formosina* Curran, 1930 **syn. n.** [Holotype examined].
- R. (C.) splendida* (Donovan). AUSTRALIA (Victoria to Queensland). [Neotype  
examined].
- australasia* Gray. [Type-material lost: synonymy established by Walker  
(1849 : 863) considered correct].
- confluens* (Enderlein). [Lectotype examined].
- evanescens* (Enderlein). [Holotype examined].
- R. (C.) transversa* Malloch. AUSTRALIA (Western Australia). [Holotype  
examined].

KEY TO SPECIES OF THE SUBGENUS *CHRYSORUTILIA*

[*Note*: The following key excludes the three species from the Philippines which are placed in separate species-groups and can be recognized from the group characteristics given elsewhere. The key attempts to place only the described species which are recognized in the present revisionary classification: specimens of undetermined, possibly new, species exist in museum collections and will not necessarily run out in the key (apart from a few species with distinctive male genitalia, such as *cryptica* sp. n., there is still much doubt about specific limits in this subgenus, and the supposed species tend to intergrade.)]

- 1 Hair of pleural regions of thorax pale yellow to golden orange. Hair of suprasquamal ridge yellow. Hair of fore coxae partly or entirely yellow to golden red. Mesonotum of ♂ with much pale yellow to golden hair (except in *idesa*). Mesonotum without conspicuous white pollinosity, appearing metallic from almost any viewpoint . . . . . 2
- Hair of pleural regions black. Hair of suprasquamal ridge black (except in *rubriceps*). Hair of fore coxae entirely black or at most with a few yellow hairs near base. Mesonotum of ♂ with entirely black hair. Mesonotum with rather thick white pollinosity on anterior part of prescutum, usually over humeral calli and usually also on a supra-alar spot each side of scutum (pollinosity usually conspicuous to naked eye, but if not then conspicuous under microscope from some viewpoint as fly is turned) . . . . . 7
- Genal hair blackish brown. Mesonotal hair of ♂ blackish brown. ♂ genitalia with surstyli and cerci as in Text-fig. 77 . . . . . *R. idesa*  
[This species is known only from Walker's ♂ holotype from an unknown Australian locality but appears to be distinct from any of the subsequently described nominal species.]
- Genal hair yellowish white to golden yellow. Mesonotal hair of ♂ mainly or entirely pale yellow to golden or golden orange. ♂ surstyli and cerci not so shaped . . . . . 3
- Species from Kei Islands. Mesopleuron with well developed white pollinose spot. Abdominal T1 + 2 with all black hair . . . . . *R. nana*

- Species from Australia. Mesopleuron without white pollinose spot and brilliant metallic, or at most with very thin pollinose overlay only visible at certain angles. Abdominal T<sub>1</sub> + 2 with some pale yellow hair at least on mid-venter and often also on anteroventral part, sometimes on whole ventral surface . . . . . 4
- 4 Ground colour of parafrontals conspicuously darker than that of parafacials, from brown to blackish; inner margins of parafrontals (along the lines of frontal setae) usually with distinct traces of metallic green showing through the pollinosity (especially in ♀), and each side of vertex extensively metallic green or blue-green between eye and ocellar triangle. Wing base of ♂ strikingly explanate, the wings appearing to have prominent basal 'shoulders'. Third antennal segment mainly dark brown. Abdomen of ♂ appearing to naked eye semipellucid tawny reddish with silvery blue or blue-green reflections (i.e. not with clear cut bands on a dark ground). ♂ surstyli and cerci as in Text-fig. 81 . . . . . **R. formosa**
- Ground colour of parafrontals reddish yellow to reddish and therefore not noticeably contrasting with ground colour of parafacials; inner edges of parafrontals without trace of metallic colour, at most only slight trace of metallic greenish showing on vertex. Wing base of ♂ not explanate. Third antennal segment bright orange (except usually some reddish brown suffusion in *panthea*). ♂ abdomen usually not so coloured, with medially interrupted transverse green bands on dark ground colour. ♂ surstyli and cerci not exactly of this shape (though similar). . . . . 5
- 5 Vestiture of fore coxae and hypopleura entirely golden orange. Setulae of post-ocular row, the vertical setae, and some thoracic setae usually golden red. Abdominal T<sub>5</sub> with some pale yellow hair laterally. Parafrontal hair usually largely pale yellow or whitish (sometimes all dark, especially in ♀). Third antennal segment unicolorous orange. Abdomen with the dark hind band of T<sub>3</sub> slightly bowed forwards on each side, so that the transverse green band of the tergite is narrower near the middle on each side than elsewhere. More elongate species in which the abdomen is conspicuously longer than its width . . . . . 6
- Vestiture of fore coxae and hypopleura partly black (the strongest setae black). Setulae of postocular row, vertical and all thoracic setae black. Hair of abdominal T<sub>5</sub> entirely black. Parafrontal hair all blackish. Third antennal segment partly suffused with reddish brown colour, especially on outer side. Abdomen with dark hind margin of T<sub>3</sub> forming a transverse band of even width (no definite bowing forwards on each side), the metallic band of this tergite therefore also of even width across the abdomen. More robust species with abdomen not noticeably much longer than its width . . . . . **R. panthea**
- 6 Basicosta pale yellow. Setae of postalar callus and fringe of costal base golden red. Median abdominal dark line evanescent, virtually absent on T<sub>4</sub>. [Western Australia] . . . . . **R. goerlingiana**  
 [This nominal species is perhaps not specifically distinct from *caesia*.]
- Basicosta blackish brown (if slightly pale then at least dark brown on anterior edge). Setae of postalar callus and fringe of costal base black (latter may have a very few red setulae intermixed). A fine purplish black median line distinct along all abdominal tergites. [Western Australia (including Monte Bello Is.) through Northern Territory to North Queensland] . . . . . **R. caesia**
- 7 Suprasquamal hair orange-yellow. Mesopleuron shining brilliantly, without white pollinose spot. Thorax without very thick white pollinosity over humeral calli and each side of scutum. ♂ surstyli as in Text-fig. 78. [Oriental Region to Queensland] . . . . . **R. rubriceps**
- Suprasquamal hair black. Mesopleuron with distinct white pollinose spot or extensively coated with white pollinosity conspicuous in some light (except in *corona*). Thorax with thick white pollinosity over humeral calli and usually on each side of scutum (if not evident to naked eye then distinct in some lights

- under microscope). ♂ surstyli and cerci usually differently shaped (but very similar in *chersipho* and *caeruleata*) . . . . . 8
- 8 Ground colour of parafrontals dark brown to blackish brown (head appearing dark to naked eye). Genal hair blackish brown. Third antennal segment dark brown to brownish black (at most only reddish orange at extreme base). Abdomen of ♂ usually showing some tawny brown colouring to naked eye visible through the metallic colouring . . . . . 9
- Ground colour of parafrontals yellow to reddish orange (head appearing distinctly yellow to naked eye). Genal hair yellow. Third antennal segment bright orange or yellow-orange (slightly suffused with darker reddish colouring in occasional specimen or brownish in *cryptica*). Abdomen of ♂ usually not showing very evident tawny colouring through the metallic colour . . . . . 10
- 9 ♂ genitalia with surstyli and cerci as in Text-fig. 75; surstylus with a blunt prominence submedially on the anterior edge and cerci in profile slender with the apical part bent slightly forwards . . . . . *R. imperialis*
- ♂ genitalia with surstyli and cerci as in Text-fig. 76; surstylus rather slender and without submedian prominence on anterior edge, cerci in profile rather bulbous medially with the apical part more or less straight and narrowed abruptly from the bulbous middle part . . . . . *R. imperialoides* sp. n. (p. 67)
- 10 Mesonotum black or purple-black with a bold pattern of silver-blue markings as follows: pair of lines submedially on prescutum reaching to suture, spot over humeral callus, supra-alar spot on scutum, spot on hind part of notopleuron, small spot on outer edge of prescutum just mesad of notopleuron (all spots with white pollinosity and very shifting appearance). Scutellum not metallic, very dark reddish brown (almost blackish brown to naked eye); posteromedian part of scutum with dark red-brown colouring similar to scutellum when seen under microscope (but black to naked eye). Abdomen blackish brown with very strongly contrasting spots or bands of light metallic silvery blue or silvery green; the bands or spots widely separated medially and shape of those on T<sub>3</sub> and T<sub>4</sub> sublunate. [Western Australia; ♂ surstylus as in Text-fig. 84] . . . . . *R. chersipho*
- Mesonotum without such pattern, ground colour not black but ranging from bright brassy green to deep blue-violet, usually with distinct darker vittae (dark specimens of *caeruleata* with deep blue-violet mesonotum may show pair of paler blue prescutal lines but if so then scutellum metallic violet also). Scutellum metallic, colour ranging from green to violet. Abdominal bands or spots deep golden green to violet-blue (rarely pale silvery in *caeruleata* but then scutellum violet); bands or spots of intermediate tergites usually not at all lunate . . . . . 11
- 11 Upper two-thirds or more of postorbites silvery white pollinose, sharply contrasting in colour with the golden yellow genae and postbuccae. [Eastern Australia] . . . . . 12
- All of the postorbites distinctly yellow pollinose, colour of postorbites therefore not strongly contrasting with the golden yellow genae and postbuccae. [Western Australia] . . . . . 15
- 12 Mesopleuron with distinct white pollinose spot which is very conspicuous to naked eye. Body length usually 14-18 mm (occasional ♂ specimens slightly smaller). Cerci and surstyli of ♂ of varied form . . . . . 13
- Mesopleuron without white spot, entirely shining. Length 13-14 mm. ♂ surstyli and cerci in profile similar to *rubriceps* (Text-fig. 78), surstyli in posterior view similar to *splendida* (Text-fig. 72) . . . . . *R. corona*
- 13 ♂ genitalia with cerci and surstyli as in Text-fig. 74; surstylus of extraordinary form, with large forwardly directed tooth-like process and strongly acuminate between this process and the apex (the large tooth projecting laterally when hypopygium viewed from behind); apical part of cerci rather straight and slender or at most slightly sinuous, the tip not bending forwards or backwards. Lower calypter haired on most of its surface (occasional specimen with hairing only in



- basal depression of calypter). Calyptrae not or only extremely faintly infusate, basal part of upper calypter not unusually opaque white. Mesonotum with very broad bold continuous black sublateral vittae . . . . . *R. cryptica* sp. n. (p. 65)
- ♂ genitalia otherwise shaped, surstylus without such tooth-like process and cerci either with tips bent forwards or backwards (Text-figs 72 & 73). Lower calypter with surface hairing mainly confined to basal depression and area adjacent to suprasquamal ridge. Calyptrae distinctly infusate on at least the apical half, the basal half of the upper calypter unusually opaque white (the white colour very conspicuous to naked eye on side view of fly and strongly contrasting with the smoky lower calypter). Sublateral dark vittae of mesonotum either bold, broad and continuous or evanescent on scutum and broken at the suture . . . . . 14
- 14 ♂ genitalia with surstyli and cerci as in Text-fig. 73; surstylus with blunt antero-median projection and the cerci is profile very strongly recurved at their apices. Sublateral black vittae of mesonotum very broad, bold and continuous (no exceptions seen) . . . . . *R. decora*
- ♂ genitalia with surstyli and cerci as in Text-fig. 72; surstylus simple, without trace of prominence on its anterior edge, and cerci rather straight for most of their length but with the extreme tips bent distinctly forwards. Sublateral black vittae of mesonotum sometimes very broad, bold and continuous (especially in specimens from southern part of range) but usually fine and inconspicuous, evanescent on scutum and broken at transverse suture in Queensland specimens . . . . . *R. splendida*
- 15 Mesonotum dark bluish green to deep blue-violet, with the darker vittae very inconspicuous to naked eye (pair of lighter blue lines sometimes present on prescutum). Surstylus of ♂ genitalia in profile as in Text-fig. 79, not deeply concave on its anterior edge. White pollinosity of thoracic dorsum very inconspicuous to naked eye . . . . . *R. caeruleata*
- Mesonotum pale brassy green with the four black vittae very boldly marked. Surstylus of ♂ genitalia in profile rather deeply concave on anterior edge and strongly acuminate on apical half (Text-fig. 82). White pollinosity of thoracic dorsum conspicuous to naked eye on prescutum anteriorly between the vittae, on humeral callus and on supra-alar area of scutum . . . . . *R. transversa*

*Rutilia (Chrysorutilia) cryptica* sp. n.

(Text-fig. 74)

♂. *Head.* Ground colour mainly yellow-orange to reddish orange on parafrontals and interfrontal area, genal dilations with some slight metallic golden green reflections in some lights; pollinosity mainly bright yellow, thinner on parafrontals than on parafacials, but pollinosity of postorbital silvery white over dark ground colour; upper occiput dark metallic green; parafrontals with a little dark brown colouring just below vertex. Parafrontal and most of parafacial hair black or brownish black; genal, postbuccal and lower parafacial hair yellow to golden orange; occipital hair yellowish white. Vertex 0.21-0.24 of head-width (0.22 in holotype). Frontal setae very fine, mostly hair-like, lowermost ones crossing at tips. Gena 0.48-0.61 of eye-height (0.56 in holotype). Parafacial very wide, about 4.0 times as wide as third antennal segment, completely haired. Antennae reddish orange on first two segments and base of third, remainder of third segment suffused with darker reddish brown to brown colouring; antennae falling short of epistome by about their own length; third segment about 2.1 times as long as second segment. Palpi yellow. *Thorax.* Dorsum golden green to violaceous blue with four very broad bold black vittae and blackish side-margins, the submedian pair of vittae stopping on scutum just beyond transverse suture, the sublateral black vittae continuous to hind margin of scutum and neither broken nor constricted at transverse suture; white pollinosity present over humeral calli, anteriorly on prescutum over the metallic areas between the pairs of black vittae, and on supra-alar spots, the pollinosity only conspicuous in

some lights. Sides of thorax purplish black or very dark brownish black with metallic areas coloured blue-green to purple-violet on upper sternopleuron and mesopleuron, the mesopleural metallic area largely covered by a bold white pollinose spot (conspicuous to naked eye); metallic areas of sternopleuron and mesopleuron often outlined with more violaceous colour than rest of metallic area. Thoracic hair (including suprasquamal ridge hair) entirely black. *Wings*. Basicosta black. Wing membrane clear hyaline (except for usual brown sub-basal area). First basal cell almost completely devoid of microtrichia. Calypterae semi-translucent whitish, lower calypter at most only very faintly smoky, upper calypter not strikingly opaque white on basal part and therefore not very conspicuous to naked eye in side view; lower calypter with long dark erect hair on most of its surface (occasional specimen with hair confined to basal depression of lower calypter). *Legs*. Black with all black hair. Hind tibia with the *ad* fringe well developed and without *pd* setae. *Abdomen*. Ground colour blackish, purplish black or very dark tawny brownish with a pattern of golden green, light bluish green or slightly violaceous metallic areas arranged in spots or bands; black median vitta distinct to naked eye. T<sub>1</sub> + 2 with a long transverse metallic area, slightly diffuse on each side; T<sub>3</sub> with a pair of submedian and a pair of lateral metallic spots, the submedian and lateral spot of each side sometimes narrowly or broadly coalesced so that each side of T<sub>3</sub> has a metallic band; T<sub>4</sub> with a pair of submedian and a pair of lateral metallic spots which appear always to be well separated; T<sub>5</sub> with a large metallic area on each side which is slightly excavate on its anterior margin so that the metallic area is slightly V-shaped or slightly lunate. All abdominal hair black, recumbent except on last tergite. Genitalia (Text-fig. 74): surstylus of very remarkable form, with a large sub-basal to submedian anteriorly and outwardly directed process and strongly excavate between this process and the apex, apical part as a whole strongly acuminate (the anterior process conspicuous in posterior view of hypopygium as well as in profile); cerci very slender on the apical third and this part very slightly sinuous, but actual apices of cerci not directed either forwards or backwards. *Measurements*. Body length about 11.5–15 mm, wing length about 12.5–15.5 mm.

♀. Generally similar to ♂ but ground colour of abdomen more distinctly black and metallic areas of abdomen tending to be more coppery green. White pollinosity of mesonotum more conspicuous than in ♂ and very conspicuous to naked eye between the black vittae of the prescutum and laterad of the sublateral vittae. No proclinate orbital setae. Vertex 0.27–0.29 of head-width. Hind tibia with either one or two small *pd* setae. Probably averaging larger than ♂ (three specimens seen with body length about 15 mm).

#### MATERIAL EXAMINED

Holotype ♂, AUSTRALIA: South Australia, near Moonta, 16.ix.1904 (*W. Wesche*). In British Museum (Natural History), London.

Paratypes. AUSTRALIA: 2 ♂, Victoria, Bright (*H. W. Davey*). 1 ♂, Victoria (*C. French*). 1 ♂, New South Wales, Barrington Top, 13–17.xii.1921 (*G. Goldfinch*). 2 ♂, 3 ♀, 'Australia' (no other data) (ex coll. Bigot). All paratypes in British Museum (Natural History).

DISTRIBUTION. Known only from south-eastern Australia.

AFFINITIES. *R. (C.) cryptica* sp. n. was in the past confused with *R. (C.) splendida* (Donovan) and *R. (C.) decora* to which it is certainly extremely closely allied. It has very similar or in some specimens identical metallic colour patterning to these species, but is distinguished from both of them (and from all other Rutiliini) by the quite exceptional shape of the surstyli (Text-fig. 74) mentioned in the description and the key; the surstylus shape is so characteristic that the species can be recognized immediately the male genitalia are examined. The shape of the apical part of the genital cerci also distinguishes *cryptica* from *decora* and *splendida* (in *cryptica* the

tips of the cerci are neither bent forwards nor backwards, whereas in *decora* they are recurved and in *splendida* bent forwards at the extreme tips). Other features are sufficiently well correlated with the genital differences to be of some value in distinguishing *cryptica* from *splendida* and *decora*; these include the non-infusate lower calypter (lower calypter extensively smoky brown in *splendida* and *decora*) and the unusually hairy lower calypter (in nearly all specimens of *cryptica* the lower calypter is haired on most of its surface, whereas in the other two species the lower calypter is hairy only in its basal depression). *R. cryptica* is of interest in this character because the extent and density of long dark erect hairing is much greater than in any other species of the subgenus *Chrysorutilia* (and therefore the lower calyptres are much more hairy than in any other Rutiliine, as lower calyptres are found only in the segregate *Chrysorutilia* and nowhere else in the tribe Rutiliini).

***Rutilia (Chrysorutilia) imperialoides* sp. n.**

(Text-fig. 76)

♂. *Head.* Ground colour of parafacials and genae mainly brownish orange, epistome more tawny yellow, parafrontals and outer margins of parafacials against the eyes blackish brown; genal dilations with golden green reflections in some lights (especially towards postbuccae); upper occiput dark metallic green; pollinosity mainly whitish over hind parts of genae and along parts of parafacials against the eyes, brownish yellow on upper anterior parts of genae and on parafacials (except against eye margins), greyish yellow on parafrontals; postorbital greyish white pollinose over dark ground; interfrontal area brick red. Hair of parafrontals, parafacials, genae and postbuccae black; occipital hair yellowish white. Vertex 0.15–0.17 of head-width. Frontal setae irregular, hair-like, apices of rows not meeting. Gena 0.36–0.40 of eye-height. Parafacial very wide, about 4.5 times as wide as third antennal segment, entirely haired. Antennae very small, falling short of epistomal margin by much more than their own length; basal segments dark reddish brown (more reddish orange on apex of segment 2), third segment brownish black except for narrow trace of orange colour at junction with second segment; third segment about twice as long as second segment. Palpi reddish orange. *Thorax.* Mesonotum dark metallic green with variable tinges of blue and violet, and with four broad bold black vittae; the submedian pair of vittae stopping on scutum just behind transverse suture, the sublateral pair appearing to naked eye to be completely continuous but actually narrowly broken at transverse suture (the prescutal part of the sublateral vitta stopping just short of transverse suture so that prescutum is very narrowly metallic green between end of the black line and the suture itself); humeral calli and anterior metallic parts of prescutum with distinct overlay of white pollinosity, supra-alar area only with an exceedingly thin trace of whitish pollinosity visible in some lights (i.e. no definite white pollinose supra-alar spots). Scutellum metallic dark green to violet). Sides of thorax black with metallic dark green to violaceous area on upper sternopleuron and on disc of mesopleuron; the mesopleural metallic area overlaid by white spot of thick pollinosity (most conspicuous from above). Thoracic hair (including that of suprasquamal ridge) entirely black. *Wings.* Basicosta black. Wing membrane clear hyaline (except for usual brown sub-basal mark). First basal cell with microtrichia along its length. Calyptres yellowish white with some very faint trace of yellowish brown suffusion. Lower calypter almost completely bare, only a few erect dark hairs at extreme base of basal depression adjacent to suprasquamal ridge. *Legs.* Black with black hair. Hind tibia with *ad* fringe short, especially on apical third, and without *pd* setae or with one minute submedian *pd* setula. *Abdomen.* Dark reddish brown with a broad black conspicuous median vitta and with metallic areas on all tergites which range from cupreous to blue-green. Metallic areas arranged as follows: transverse strip on each side of T1 + 2; band on each side of T3



which occupies the anterior two-thirds of tergite length; similar but narrower band on each side of T<sub>4</sub> occupying only about half tergite length; large metallic area on each side of the black median vitta on T<sub>5</sub> which occupies most of side of tergite and extends forwards to abut directly against hind margin of preceding T<sub>4</sub>. All abdominal hair black; dorsal hair recumbent on T<sub>1</sub> + 2 to T<sub>4</sub> (at most a little erect hair anteromedially on T<sub>3</sub> and hairing of hind margin of T<sub>4</sub> semi-erect as usual). Genitalia (Text-fig. 76): Surstylus in profile rather slender and simple (without trace of process on anterior edge), cerci in profile conspicuously bulbous medially and rather abruptly narrowing into the long, slender and rather straight apical part. *Measurements*. Large species, body length about 16–17 mm, wing length about 15–16 mm.

[♀. Not positively associated. Specimens in BMNH collection believed to be probably females of *imperialoides* have following features: Generally darker than ♂ with dark greenish colour of mesonotum less conspicuous because of stronger development of thick white pollinosity combined with very heavy black vittae; white pollinosity thick and conspicuous over humeral calli, supra-alar spots, three longitudinal lines on prescutum (between and on outer side of the submedian black vittae), over notopleuron and on a small spot on extreme outer edge of prescutum. Calyptrae more infuscate than in ♂, opaque white base of upper calypter therefore more conspicuous. Abdomen very black with deep gold-green or cupreous metallic spots or areas as follows: transverse strip on each side of T<sub>1</sub> + 2; pair of submedian and pair of lateral spots on T<sub>3</sub>; pair of very small (much smaller than those on T<sub>3</sub>) submedian spots and pair of lateral spots on T<sub>4</sub>; very large subtriangular metallic area on each side of T<sub>5</sub> which does *not* reach forwards as far as the hind margin of T<sub>4</sub> (i.e. separated from latter by a narrow strip of black ground colour). Metallic spots on each side of T<sub>3</sub> sometimes partially or completely coalesced into a transverse band across each side of tergite. No proclinate orbital setae. Vertex 0.26 of head-width. Hind tibia with one or two small *pd* setae. Averaging larger than ♂, body length about 17–19 mm, wing length about 16–18 mm.]

#### MATERIAL EXAMINED

Holotype ♂, AUSTRALIA: New South Wales, Wee Jasper, xii.1920. In British Museum (Natural History), London.

Paratypes. AUSTRALIA: 1 ♂, same data as holotype. 1 ♂, Victoria (*F. du Boulay*). Both paratypes in British Museum (Natural History).

In addition to the ♂ holotype and paratypes cited above I have seen four female specimens in the BMNH collection which probably are conspecific. However, as positive association of these females with the males cannot be made at this time I exclude them from the type-series. Their data are: 1 ♀, Victoria, Monbulk, 1895; 1 ♀, Victoria (*C. French*); 1 ♀, New South Wales, Katoomba, Blue Mts, 3000–3300 ft, i.1912 (*Dodd junior*); and 1 ♀, Australian Capital Territory, Paddy's River, 2.ii.1955 (*Paramonov*).

DISTRIBUTION. South-eastern Australia including Victoria, New South Wales and Australian Capital Territory.

AFFINITIES. During the present revisionary work it was found that two quite distinct forms of genitalia were found amongst males of the supposedly single species previously identified by authors as *Rutilia imperialis* Guérin-Méneville. In one form (Text-fig. 75) the surstylus has a blunt submedian prominence on the anterior edge and the cerci in profile are very slender and have the apical part bent slightly forwards; in the other form (Text-fig. 76) the surstylus is much narrower and completely lacks any trace of a prominence on the anterior edge, and the cerci in profile are very distinctly bulbous medially with a rather sudden contraction to the straight slender apical part. This difference can be recognized immediately the

male genitalia are examined (after removal from the fly), and there appear to be no intermediates. It has therefore been concluded that '*imperialis*' of authors consists of a confusion of two very closely allied species which are indistinguishable on external characters (or apparently so as none have been found of any value). As Guérin-Méneville's type-material (which included a male specimen) is lost it was uncertain to which of the two species his name *imperialis* should be applied; this has therefore been resolved by neotype designation (see p. 125). The species with the prominence on the surstylus and the very slender cerci appears to be more common than the other species and the neotype specimen chosen for *imperialis* (which shows the genital characters clearly although the hypopygium remains in situ) is therefore of this species; there is no available name for the second species, which is therefore here described as new with the name *imperialoides*. The new species is clearly extremely closely allied to *imperialis* and examination of male genitalia is essential for accurate identification of *imperialoides* and *imperialis*.

#### Subgenus *DONOVANIUS* Enderlein stat. n.

*Donovanius* Enderlein, 1936 : 409. Type-species: *Musca regalis* Guérin-Méneville, 1831, by original designation.

*Psaronia* Enderlein, 1936 : 414. Type-species: *Psaronia bisetosa* Enderlein, 1936, by original designation. **Syn. n.**

*Menevillea* Enderlein, 1936 : 416. Type-species: *Rutelia pellucens* Macquart, 1846, by original designation [presumed correctly identified, but see discussion]. **Syn. n.**

DIAGNOSIS. Parafrontals pollinose, not metallic. Epistome and genae non-metallic. Facial carina flattened, slightly widened at level of base of third antennal segment, merging into lunula without a distinct depression. Parafacials bare or partially haired (hairing if present normally not reaching as low as bottom of eye). ♀ normally without proclinate orbital setae (one or two present in some specimens). Arista micropubescent. Humeral callus with 3-4 setae, inner one or two sometimes scarcely differentiated from hair, very rarely only outer two present. Posthumeral setae absent or one inner posthumeral developed just mesad of humeral callus. Usually one *post ia* seta, occasionally none, rarely a small second seta developed. Scutum with or without some supernumerary prescutellar setae. Postalar callus with 4 (rarely 5) strong setae. Suprasquamal ridge thickly long haired. Scutellum flattened; with 4-10 pairs of marginal setae (these sometimes, stiff, straight, slightly spiniform); marginals not preceded by any preapical setae. Hair of lower part of pteropleuron not developed in front of level of posterior sternopleural seta. One sternopleural seta (0 + 1), rarely trace of a small anterior *stpl* seta (especially in ♀). Prosternum bare; prosternal membrane with or without some long soft hair. Hind tibia with long regular anterodorsal fringe (without evident *ad* setae amongst it) and without *pd* setae or with only one such seta (very rarely trace of second *pd*). Abdomen with median depression in last tergite (T5). T3 without median marginal setae (rarely one pair in ♀), with lateral marginal setae. T5 with median transverse row of strong erect setae. Sternite 5 of ♂ with simple non-prominent rounded lobes. ♂ genitalia with distal membranous part of distiphallus subequal in length to or at most only slightly longer than sclerotized proximal part, and with extremely large foliaceous surstyli (Text-figs 66-71). [Mainly large forms measuring 15-23 mm, with dark head ground colour and usually dark unicolorous body, never with bold spot pattern.]

DISTRIBUTION. Mainly distributed throughout Australia and Tasmania, but a few species also in Solomon Islands, New Hebrides, Fiji and Samoa. Unknown from the Oriental Region and New Guinea.

DISCUSSION. This subgenus includes nearly one-third of the species of *Rutelia* s.l., and contains most of the large brown, blackish or purplish or dark green Australian species in which, even to the naked eye, the end of the abdomen appears excavate because of the median depression or groove in the last tergite. As early as 1775 Fabricius had described a species of this subgenus with a name (*R. retusa*) which apparently alludes to the blunt-ended appearance given to these flies by the apical excavation, and several common eastern Australian species belonging in *Donovanius* were described by the other early authors, such as *inusta* Wiedemann, *regalis* Guérin-Méneville, *viridinigra* Macquart and *sabrata* Walker.

One of the species undoubtedly belonging in this subgenus is *R. pellucens* Macquart, for which a neotype is designated in this paper. This species was cited by Enderlein (1936) as the type-species of his genus *Menevillea*, but there are some slight discrepancies between the characters cited by Enderlein for *Menevillea* and those shown by the true *pellucens* as identified by Macquart and fixed by neotype (for example Enderlein mentions the presence of marginal setae on T<sub>3</sub> and 'Discalmacrochaeten', i.e. preapicals, on the scutellum). I have not seen the two female specimens determined and cited as *pellucens* by Enderlein (1936 : 416), but for the present am presuming Enderlein's identification to be correct, in which case it follows that *Menevillea* is a new synonym of *Donovanius* Enderlein. However, if it should prove (when Enderlein's specimens are located) that his *pellucens* was misidentified, then the name *Menevillea* would fall as a synonym of *Grapholostylum* or just possibly *Rutelia* s.str., but in any event it is certainly a synonym of an older name. (It is therefore of no practical importance whether Enderlein identified *pellucens* correctly or not.)

Enderlein's genus *Psaronia* was characterized mainly by having a single pair of median marginal setae on T<sub>3</sub> and by little else that notably distinguished it from *Donovanius*. It was based only on two female specimens (one herein designated lectotype). Examination of the lectotype of the type-species, *bisetosa*, shows that there are really no differences which justify holding *Psaronia* as a distinct taxon from *Donovanius* at supraspecific level and *Psaronia* is therefore placed as a synonym of the latter name.

Reference needs to be made here to Enderlein's genus *Psaroniella*, for which *Rutelia castanipes* Bigot was cited as type-species. In this case it is known positively that Enderlein misidentified the type-species, for I have seen the single female specimen (from Victoria, Koonwarra, Gippsland) that Enderlein cited as *castanipes* and found that it belongs to a completely different species from that described by Bigot. The true *castanipes* Bigot (type-material in BMNH examined) is a species of the subgenus *Donovanius* here defined, and the name is a junior synonym of *R. inusta* (Wiedemann); the specimen misidentified by Enderlein as *castanipes* actually belongs in the subgenus *Rutelia* s.str., and is a specimen of *R. setosa* Macquart. The generic name *Psaroniella* Enderlein is therefore a synonym of *Rutelia* s.str. and not of *Donovanius*.

The affinities of subgenus *Donovanius* seem clearly to lie most closely with *Chryso-rutelia*. Both subgenera have four or more postalar setae, both have a very well developed fringe or comb of close-set setulae on the anterodorsal surface of the hind



tibia, both have extremely bushy and often crinkled hair on the suprasquamal ridge and there is normally only a single (posterior) sternopleural seta; other resemblances include the occurrence in most forms of hairing on the prosternal membrane, and general similarity in the shape of the facial carina (which tends to be rather flattened on the anterior face and to merge rather gradually into the lunula so that there is only a weak depression where carina and lunula coalesce). The broad sulcate last abdominal tergite with its transverse row of strong setae provides the most obvious external feature distinguishing *Donovanius* from *Chrysorutilia*, though the difference in the pteropleural hairing mentioned in the subgeneric key and shown in Text-figs 19 & 20 appears to apply constantly throughout the subgenera and to provide a real distinction. The large heavy foliaceous surstyli of the ♂ genitalia of *Donovanius* are very different from the narrow pointed surstyli found in *Chrysorutilia* (cf. Text-figs 66-71 & 72-84), and the ♂ genitalia therefore readily distinguish these two subgenera. Another minor difference between them, but one which is apparently constant, is the lack of any hairing actually on the prosternum in *Donovanius* which contrasts with the presence of at least a few fine hairs on the anterior corners of the prosternum in *Chrysorutilia*.

The species of *Rutilia* s.str. look superficially much like *Donovanius* on account of the grooved apex to the abdomen, but are at once separable by the presence of only three postalar setae and by the lack of a hind tibial fringe, and by the differently shaped ♂ surstyli (cf. Text-figs 54-57 & 66-71).

*Donovanius* species appear to be entirely unrepresented in the Oriental Region, but the distribution of the subgenus is more extensive in the Pacific islands than that of other subgenera, which are either confined to Australia (*Neorutilia*, *Ameniamima*, *Rutilia* s.str.) or else do not occur so far as is known anywhere further east than New Guinea and Australia (*Grapholostylum*) or the New Hebrides (*Chrysorutilia*). One species of *Donovanius* is known from Fiji (*transfuga* Bezzi) and two from Samoa (*savaiiensis* Malloch and *nigrihirta* Malloch), whence these are, respectively, the only Rutiliines known to occur. Samoa in Polynesia represents the easternmost limit of distribution of the tribe Rutiliini as a whole.

The British Museum (Natural History) collection contains a female specimen of the Samoan species *Rutilia* (*Donovanius*) *nigrihirta* Malloch which was reared from a larva of a Lucanid beetle identified as a species of *Aegus* Macleay, probably *A. upoluensis* Arrow; this seems to be the first fully authenticated host record for a species of subgenus *Donovanius*.

The species of *Donovanius* do not aggregate in any obvious way, and no species-groups are recognized within the subgenus. The ♂ genitalia with their very distinctive form of surstyli are extraordinarily uniform in all the species (or supposed species) of the subgenus.

Most of the synonymies shown in the list of included species that follows require no special comment, but amplification is needed here concerning *R. (D.) sabrata* (Walker) and *R. (D.) bisetosa* (Enderlein). One of the species of *Donovanius* is a large blackish brown form with dark violet reflections and unusually long antennae compared to those of other *Rutilia* species, and it was to this species that Malloch (1927 : 347; 1929 : 300) applied Guérin-Ménéville's name *inornata*, using (in the

later paper cited) the antennal length as a key character; as a result, Paramonov following Malloch has identified some specimens of the long-antenna species in different museum collections as *inornata* Guérin-Ménéville. Neither Malloch nor Paramonov saw Guérin-Ménéville's two original syntypes in Paris Museum, and Malloch's identification—working from the description alone—was reasonable; however, examination of the two *inornata* types during the present work (one of them bearing an original Guérin-Ménéville label and herein designated lectotype, p. 72) has shown that the true *inornata* belongs in the subgenus *Rutilia* s.str. and is the same species as Guérin-Ménéville's *desvoidyi* (= *vivipara* Fabricius). There are some discrepancies between the original description of *inornata* and the characters shown by the lectotype, especially as the legs are not as black as the description implies, but I see no reason to doubt that the two specimens in Paris are the two that Guérin-Ménéville mentioned. Hence it is concluded that Malloch misidentified *inornata*. But the species that he called by this name showing the long antennae was described by Walker with the name *sabrata*, and this is the valid name for the species.

From comparison of Enderlein's types of *bisetosa* (described from the ♀ in *Psaronia*) and *nigribasis* (described from ♂ and ♀ as a variety of *Donovanius fulgidus* (Macquart)) I am convinced that the respective ♀ and ♂ lectotypes designated in this paper are conspecific and I therefore place *nigribasis* as a synonym of *bisetosa*. The name *bisetosa* is chosen to stand valid for the species in preference to *nigribasis* because it alludes to the character of a pair of median marginal setae on the third (apparent second) abdominal tergite which are present in both sexes, and because *bisetosa* is the name upon which Enderlein's so-called genus *Psaronia* was based. It should be added that the ♀ lectotype of *bisetosa* and the ♂ lectotype of *nigribasis* have the same type-locality, namely Marloo Station, Wurarga, Western Australia, which strongly supports the conclusion that both names apply to the same species.

#### INCLUDED SPECIES

- Rutilia* (*Donovanius*) *agalmiodes* (Enderlein) **comb. n.** AUSTRALIA (Queensland). [Holotype examined].
- R. (D.) analoga* Macquart. AUSTRALIA (Victoria to Queensland). [Holotype examined].
- dubitata* Malloch **syn. n.** [Holotype examined].
- R. (D.) bisetosa* (Enderlein) **comb. n.** AUSTRALIA (Western Australia). [Lectotype examined].
- nigribasis* (Enderlein) **syn. n.** [Lectotype examined].
- R. (D.) brunneipennis* Crosskey **sp. n.** SOLOMON ISLANDS (Guadalcanal). [Holotype examined].
- R. (D.) ethoda* (Walker). AUSTRALIA (Western Australia). [Holotype examined].
- R. (D.) inusta* (Wiedemann). AUSTRALIA (all states). [Lectotype examined].
- castanifrons* Bigot **syn. n.** [Holotype examined].
- castanipes* Bigot **syn. n.** [Lectotype examined].

- potina* (Walker) **syn. n.** [Holotype examined].  
*spinipectus* Thomson **syn. n.** [Lectotype examined].  
**R. (D.) lepida** Guérin-Méneville. AUSTRALIA (A.C.T., New South Wales, Victoria). [Neotype examined].  
*fulgida* Macquart **syn. n.** [Lectotype examined].  
*onoba* (Walker) **syn. n.** [Holotype examined].  
**R. (D.) nigrihirta** Malloch. SAMOA (Upolu). [Holotype examined].  
**R. (D.) pellucens** Macquart. AUSTRALIA (A.C.T., New South Wales, Victoria). [Neotype examined].  
*imitator* (Enderlein) **syn. n.** [Holotype examined].  
**R. (D.) regalis** Guérin-Méneville. AUSTRALIA (A.C.T., New South Wales, South Australia, Victoria). [Neotype examined].  
*nigra* Macquart (*nomen nudum*).  
**R. (D.) retusa** (Fabricius). AUSTRALIA (Western Australia). [Holotype examined].  
*aditha* (Walker) **syn. n.** [Holotype examined].  
*viriditestacea* Macquart **syn. n.** [Lectotype examined].  
**R. (D.) sabrata** (Walker). AUSTRALIA (New South Wales, Queensland). [Holotype examined].  
*inornata* Guérin-Méneville sensu authors. Misidentification.]  
**R. (D.) savaiiensis** Malloch. SAMOA (Savaii). [Holotype examined].  
**R. (D.) spinolae** Rondani. AUSTRALIA. [Type-material not located, possibly lost; species unrecognized, tentatively assigned to *Donovanius*].  
**R. (D.) transfuga** Bezzi. FIJI (Viwa, Viti Levu). NEW HEBRIDES (Eromanga, Espiritu Santo, Malekula, Tana). [Holotype examined].  
**R. (D.) viridinigra** Macquart. AUSTRALIA (New South Wales, Queensland). [Lectotype examined].  
*barcha* (Walker) **syn. n.** [Holotype examined].  
*fuscotestacea* Macquart **syn. n.** [Holotype examined].

KEY TO SPECIES OF THE SUBGENUS *DONOVANIUS*

[*Note:* The limits of species in this subgenus are very difficult to determine. There are few structural characters that appear to have much value in separating species, and the ♂ genitalia are so uniform (or at least differ in such a subtle and intangible way) that they have little value for species recognition. It is often difficult reliably to associate males and females, and there is clearly much variation within a species in such features as hairiness of parafacials, development of median marginal setae on T<sub>3</sub>, and the number of proclinate orbital setae in females. At present the entities considered to be species differ mainly in their general appearance as shown by body colour, hair colour and size; these features seem to separate specimens into fairly convincing species, but there is considerable intergradation (new synonymies established above are based on absolute agreement between types). The key here given must be treated as very tentative: it is by no means certain that the named taxa represent distinct species, and museum collections may contain undetermined specimens that will not conform with the key. *R. spinolae* is omitted as the type has not been located and the name remains enigmatic.]

I	Australian species . . . . .	2
-	Melanesian and Samoan species . . . . .	12



- 2 Pleural regions of thorax with pale yellow or golden hair (in *bisetosa* mesopleural hair mainly dark and some dark hairs on sternopleuron). Hair of suprasquamal ridge yellow . . . . . 3
- Pleural regions of thorax with black hair (occasionally some inconspicuous pale yellow hair on fore margin of mesopleuron, on barettæ and posteroventral part of pteropleuron). Hair of suprasquamal ridge black or brownish black (some specimens of *sabrata* with some yellow hair intermixed with dark hair) . . . . . 6
- 3 Wing base explanate, wings appearing to have strongly developed basal 'shoulders'. Colouring distinctive, prescutum and scutum dark green, scutellum violet, abdomen light tawny yellow with sharp black median line. Abdomen with entire venter of T<sub>1</sub> + 2 and mid-venter of T<sub>3</sub> pale yellow haired. Surstyli of ♂ genitalia longer and narrower than usual (Text-fig. 65)
- R. agalmiodes* (♂ only, ♀ unknown)
- Wing base not noticeably explanate. Not so coloured, if abdomen rather light tawny then mesonotum only very dull greenish and scutellum not violet. Abdomen almost entirely black haired (except in *analoga*). ♂ surstyli of usual large wide form (e.g. as in Text-fig. 67) . . . . . 4
- 4 Hair of abdominal T<sub>5</sub> pale yellow or golden. Parafrontal hair of ♂ mainly yellowish white (black in ♀). Mesonotum dull dark greenish or greenish brown or sometimes blackish brown in ♀, with conspicuous whitish pollinosity, slightly contrasting with the tawny (♂) or red-brown (♀) abdomen; abdomen with distinct dark centre line. Parafacials bare or partially haired . . . . . *R. analoga*
- Hair of abdominal T<sub>5</sub> black. Parafrontal hair black in both sexes. Colour varied but not as above, whitish pollinosity of mesonotum very inconspicuous. Parafacials more or less completely haired . . . . . 5
- 5 Pleural hair entirely yellow. First basal cell of wing without microtrichia.<sup>2</sup> Abdominal T<sub>3</sub> without median marginal setae. Colouring generally dark, slightly metallic, greenish blue or violaceous . . . . . *R. retusa*
- Pleural hair mainly blackish on mesopleuron and sometimes on upper edge of sternopleuron. First basal cell with microtrichia.<sup>2</sup> Abdominal T<sub>3</sub> usually with a pair of median marginal setae. Colour varying from dark bronze-green to coppery brown or blackish brown, sometimes with purplish red tinge on abdomen
- R. bisetosa*
- 6 Predominantly green species, colour ranging from light golden green to dark green or blue-green. Abdomen with fine dark median line and dark tergite hind margins well visible to naked eye . . . . . 7
- Colour not green but ranging from red-brown to blackish brown or violaceous black, sometimes with bronze or coppery purple tinges (rarely slight trace of very dark green colour visible but then over an almost black general colour). Dark median abdominal line and dark tergite hind margins inconspicuous to naked eye (except in ♂ of *pellucens*) . . . . . 8
- 7 Abdomen of ♂ with ground colour of intermediate tergites (T<sub>3</sub> and T<sub>4</sub>) pale tawny reddish, the tawny colour clearly visible to the naked eye through the metallic green or bluish tints (especially as fly is turned); these two tergites also with rather thick white overlay of pollinosity which makes them appear distinctly white when viewed from behind. ♂ usually 15-17 mm in body length . . . . . *R. lepida*  
[♀ not definitely associated: golden green to blue-green females resembling those of *regalis* but with elongate third antennal segment (c. 4-5 times as long as second segment) appear to be *lepida*]
- Abdomen of ♂ without such appearance, ground colour all dark and intermediate tergites with only very thin inconspicuous whitish pollinosity basally, abdomen therefore appearing a pure golden green to blue-green (occasional specimen coppery green). ♂ usually 17-19 mm in body length . . . . . *R. regalis*  
[Females of golden green to blue-green colour with antennae of normal length

(third antennal segment about 3 times as long as second segment) are almost certainly *regalis*]

- 8 First basal cell without microtrichia.<sup>2</sup> Blackish species with a purple or violaceous tinge in most specimens, occasionally a dark greenish black tinge (some dark brownish black specimens without metallic tinge occur and resemble *inusta*: careful check on presence or absence of microtrichia along first basal cell essential on such specimens) . . . . . 9
- First basal cell with microtrichia along its whole length (at least medially). Red-brown to very dark blackish brown species, normally without purplish tinge (some coppery purple tinge in *ethoda*) . . . . . 10
- 9 Antennae unusually long, falling short of epistomal margin by about as much as their own length in ♂ and by conspicuously less than their own length in ♀; third segment about 3.5 times as long as second segment in ♂ and 4-5 times as long as second segment in ♀ (facial carina correspondingly elongate, especially in ♀). Thorax with some very pale yellow hair on anterior edge of mesopleuron, on ventral edge of humeral callus, around prostigmatic area, on barettte and postero-ventrally on pteropleuron (sometimes also some pale hairs on suprasquamal ridge). Apical pair of scutellar setae conspicuously smaller than other scutellar marginal setae . . . . . **R. sabrata**
- Antennae of normal small size, usually falling short of epistomal margin by more than their own length in both sexes; third segment about 2-2.5 times as long as second segment in both sexes (facial carina not unusually elongate). Thorax without any pale hair. Apical scutellar setae usually not conspicuously smaller than other scutellar marginal setae . . . . . **R. viridinigra**
- 10 Thorax and abdomen with burnished coppery bronze or purplish reflections, sometimes also traces of green colouring. [Western Australia] . . . . . **R. ethoda**
- Body without such burnished reflections (at most only the scutellum faintly violet). [Eastern Australia from Tasmania to Queensland] . . . . . 11
- 11 Abdomen of ♂ light reddish brown or tawny brown with conspicuous black median line, abdomen of ♀ blackish brown or almost black with the median line scarcely detectable to naked eye. Smaller species, length usually 13-16 mm . . . . . **R. pellucens**
- Abdomen of both sexes very dark, brownish black to black, sometimes very dark reddish brown on T<sub>3</sub> in the ♂ (but ♂ abdomen consistently darker than the more tawny abdomen of ♂ *pellucens*). Larger species, length usually 16-20 mm . . . . . **R. inusta**  
[Note that the females of *inusta* and *pellucens* are not reliably distinguishable on present evidence]
- 12 Body unicolorous dark purplish brown. Epistome blackish. All hair black. Wings heavily infusate, especially on anterior half. Calypterae blackish brown. Very large species, length about 20 mm. [Solomon Islands] . . . . . **R. brunneipennis** sp. n. (p. 76)
- Body either unicolorous green or with green to blackish mesonotum and mainly tawny or reddish brown abdomen. Ground colour of epistome reddish yellow. Hair black or yellow hair present on pleural regions. Wings not infusate or (in *nigrihirta*) with yellowish brown staining along veins. Small to medium sized species, length 10-16 mm. [New Hebrides, Fiji or Samoa] . . . . . 13
- 13 Hair entirely black. Legs black. Colour uniformly dark green on thorax and abdomen. [Samoa] . . . . . **R. nigrihirta**
- Hair of pleural regions of thorax and most of the fore coxal hair pale yellow to golden orange. Legs partly reddish yellow. Abdomen mainly tawny yellow to

<sup>2</sup> The microtrichia of the first basal cell are very small, and care is needed to determine whether the cell is bare (i.e. without microtrichia beyond the brown-pigmented base) or whether it has a band of microtrichia along its length (even when present the microtrichia are sometimes confined to an area along the middle of the cell). The cell needs to be examined by transmitted light at a magnification not less than × 100.

- reddish brown and contrasting with green or blackish mesonotum (some specimens with golden green abdomen rather similar to mesonotum but then pale ground showing through the green colour). . . . . 14
- 14 Unusually small species, length 10–11.5 mm. Bristling of venter of sternopleura, mid and hind coxae and prescutellar region not noticeably spiniform. Femora entirely reddish yellow. [Samoa] . . . . . *R. savaiiensis*
- Larger species, length 12.5–16 mm. Bristling of venter of sternopleura, mid and hind coxae, prescutellar region and scutellum very strong, stiff, rather straight and sub-spiniform. Femora either reddish yellow or partly or mostly darkened to reddish brown or dark brown. [Fiji and New Hebrides] . . . . . *R. transfuga*

*Rutilia (Donovanius) brunneipennis* sp. n.

♀. *Head*. Ground colour brownish black on most of head, genal regions dark reddish brown, epistome black. Head pollinosity very thin and whitish, bases of parafrontal hairs appearing as slightly darkened minute dots. Parafrontal and parafacial hair black, genal hair blackish brown, occipital hair yellowish white. Vertex 0.25 of head-width. Frontal setae very fine, meeting or crossing at tips. Proclinate orbital setae absent. Gena very wide, 0.50 of eye-height. Parafacial about three times as wide as third antennal segment, with short sparse black hairs on most of its height. Antennae black and slightly elongate (facial carina correspondingly slightly longer than usual), third segment about 2.5 times as long as the rather long second segment; antennae falling short of epistomal margin by about 1.3 times their length. Palpi brownish with tawny apices. *Thorax*. Dark purplish brown with no evident metallic colour to naked eye (mesonotum with slight coppery purple glints under microscope); mesonotum without obvious pollinosity and without definite dark vittae (thin trace of whitish pollinosity present on prescutum and visible under microscope when seen from behind). All thoracic hair black. Scutellum with eight pairs of marginal setae (apicals included), the apical pair very much smaller than other marginals; scutellar marginals (and also the prescutellar setae) rather stiff and straight.  $o + 1$  *stpl* setae. *Wings*. Basicosta black. Wing membrane distinctly infusate, especially anterobasally, suffused with dark brown along the veins and especially on *r-m* cross-vein. First basal cell completely microtrichiate, as the rest of the wing. Calyptrae blackish brown with brown fringe hair. *Legs*. Black with entirely black hair. Hind tibia with well formed even close-set *ad* fringe. *Abdomen*. Dark purplish brown with entirely black hair, concolorous with thorax. T<sub>3</sub> without median marginal setae. Hair of T<sub>3</sub> recumbent, of T<sub>4</sub> semi-erect, and of T<sub>5</sub> erect. *Measurements*. Large species, body length about 20 mm, wing length about 19 mm.

♂. Unknown.

MATERIAL EXAMINED

Holotype ♀, SOLOMON ISLANDS: Guadalcanal, Suta, 27.vi.1956 (*E. S. Brown*). In British Museum (Natural History), London.

DISTRIBUTION. Known only from the holotype from Guadalcanal in southern Solomon Islands.

AFFINITIES. *R. brunneipennis* sp.n. unquestionably belongs in the subgenus *Donovanius*, although it should be noted that the holotype is aberrant in one respect: the postalar callus of the left side has the normal 4 strong setae, whereas that of the right side has only three postalar setae. It is the only species of the subgenus yet known from the Solomon Islands. The heavy infuscation of the wings (to which the specific name alludes) makes the species appear quite distinctive, though in the general very dark and uniform colouring it is rather similar to *R. (D.) inusta*, to which it is perhaps closely allied. The ♂ is unknown, but as the ♂ genitalia in



*Donovanius* are of very little or no use for identification it is considered justified to describe this new species from a female holotype.

### Subgenus *RUTILIA* Robineau-Desvoidy

*Rutilia* Robineau-Desvoidy, 1830 : 319. Type-species: *Tachina vivipara* Fabricius, 1805, by subsequent designation of Crosskey (1967 : 26).

*Psaroniella* Enderlein, 1936 : 417. Type-species: *Rutilia castanipes* Bigot sensu Enderlein [misidentification] [= *Rutilia setosa* Macquart, 1847], by original designation. **Syn. n.**

*Stiraulax* Enderlein, 1936 : 428. Type-species: *Tachina vivipara* Fabricius, 1805, by original designation. [Isogenotypic name with *Rutilia* Robineau-Desvoidy, junior objective synonymy first noted by Crosskey (1967 : 26)].

**DIAGNOSIS.** Parafrontals pollinose, not metallic. Epistome and genae non-metallic. Facial carina with anterior surface of upper part convex or with slight median ridge and only lower part flattened on anterior surface, sides slightly pinched-in ventrally, separated from lunula by distinct depression well visible in profile. Parafacials bare or haired. ♀ with proclinate orbital setae (normally one pair well developed, rarely two each side, very rarely absent). Arista micropubescent. Humeral callus with 3-4 setae. Posthumeral setae distinct in both sexes, variably from 1-3 each side. One or two *post ia* setae. Scutum without supernumerary prescutellar setae (rarely the last *post acr* seta doubled). Postalar callus with three strong setae. Suprasquamal ridge haired or bare. Scutellum with slight dorsal flattening or hollowing just before tip; with 5-7 pairs of marginal setae (these rather stiff and straight); with a well developed transverse row of small preapical setae preceding the marginals. Pteropleuron not haired in front of level of posterior sternopleural seta. Two or three sternopleural setae (1 + 1 or 2 + 1). Prosternum and prosternal membrane bare. Hind tibia without definite anterodorsal fringe or with short inconspicuous fringe, normally from 1-3 *ad* setae well developed, 2-4 well developed *pd* setae or occasionally one *pd* only in ♂. Last abdominal tergite (T5) with median depression (rather small and shallow in *confusa*). T3 with transverse row of several (usually 6-12, but often only 2-4 in *confusa*) strong erect often spiniform median marginal setae, the row slightly arcuate forwards so that middle setae of the transverse row are more distant from hind margin of the tergite than the others; T3 also with lateral marginal setae. T5 with median transverse row of strong erect setae. Surstyli of ♂ genitalia of rather varied form (Text-figs 54-57). [Dull reddish brown, tawny or blackish brown forms, with little or no metallic colouring, at most with very slight reddish violet or greenish tinge dorsally on thorax and intermediate abdominal tergites].

**DISTRIBUTION.** Occurring only in Australia from Tasmania to Queensland.

**DISCUSSION.** Before considering the characteristics and interrelationships of *Rutilia* in the strict sense it is necessary briefly to discuss the type-species of the genus and its fixation, for there has been some confusion in past taxonomic bibliography; although, fortunately, this has not affected the generic concept of *Rutilia*. The genus when originally described by Robineau-Desvoidy contained four nominal species, one of which was *Rutilia vivipara* (Fabricius), which Fabricius (1805) had described in the genus *Tachina* Meigen. Robineau-Desvoidy's (1830) identification of *vivipara* related to a specimen that stood in the collection of Count Dejean, and may or may not have been correct, but there has never been any means of confirming the rightness of Robineau-Desvoidy's identification because both the specimen from Dejean's collection and Fabricius' type of *vivipara* are lost. But there are a few discrepancies between the brief descriptions of Fabricius and Robineau-Desvoidy (the latter for instance mentioning a bluish tinge on the mesonotum) and on the basis

of these Guérin-Méneville (1843 : 264) concluded that Robineau-Desvoidy was dealing with a different species from Fabricius (though as he had not, it seems certain, seen the specimens of either author his conclusion was based on little more than guesswork). Following upon his conclusion, Guérin-Méneville (*op. cit.* : 264, 269) described the species supposedly misidentified by Robineau-Desvoidy as *Rutilia desvoidyi* Guérin-Méneville, and subsequent references to the Rutiliini contain various citations of the type-species of *Rutilia* as *vivipara* or as *desvoidyi*. I have earlier (Crosskey, 1967 : 26) shown that none of these citations were valid for type-fixation, either because the fixation was made ambiguously, or the name cited was not that of a nominal species or was that of a species not originally included in *Rutilia*, and I therefore published a designation of *Tachina vivipara* Fabricius as type-species of *Rutilia*. In the present revisionary work it is now most desirable to establish beyond any future doubt the identity of *vivipara* Fabricius, as this species is the nomenclatorial pivot of the whole Rutiliini, and to show that *desvoidyi* Guérin-Méneville is in reality a junior synonym of *vivipara* Fabricius.

The original description of *vivipara* might not be readily accessible to Australian dipterists likely to work on the Rutiliini, and I therefore quote it here: *Tachina vivipara*

'T. pilosa grisea, abdomine ferrugineo, scutello cupreo.

Habitat in Insulis maris pacifici carnes consumens vivipara. Dom. Billardiere.

Magna. Caput griseum, ore albido. Thorax pilosus, griseus, fusco lineatus.

Scutellum cupreum, nitidum. Abdomen pilis atris, rigidis hirtum, subferrugineum, segmentorum marginibus nigris. Pedes pallide testacei.'

All later workers have assumed, and I agree with this assumption, that the provenance of Fabricius' specimen was almost certainly Australia, though recorded as 'Insulis maris pacifici'; localities of origin were often very imprecisely recorded at the time when Fabricius was writing, and although some *Rutilia* are now known from the Pacific islands it cannot be said that Fabricius' description fits any of them at all well. On the other hand, for such an early work, it is an extremely good description of a common *Rutilia* species which occurs throughout eastern Australia from Cape York to Tasmania and which has been commonly identified as *vivipara* for many years. This species has entirely reddish yellow legs, a ferruginous colour often with rather coppery scutellum, conspicuous blackish brown thoracic vittae, blackish hind margins to the abdominal segments, and exceptionally strong rather spiniform abdominal bristling, and is therefore a virtually perfect match with Fabricius' statements (respectively 'pedes pallide testacei', 'abdomine ferrugineo', 'scutellum cupreum, nitidum', 'thorax . . . fusco lineatus', 'abdomen . . . segmentorum marginibus nigris', and 'rigidis hirtum'). There is only one large (Fabricius' 'magna') species of *Rutilia* with all pale legs, strongly vittate thorax, dark reddish brown colouring, and such strongly bristled abdomen, and it is to this species that Fabricius' name *vivipara* unquestionably applies and it is from this species that a neotype for *vivipara* has been designated elsewhere in this paper (see p. 126).

With the identity of *vivipara* Fabricius objectively pinned down by neotype it is now possible to determine whether *desvoidyi* Guérin-Méneville is distinct from *vivipara* or not. One of three original syntypes of *desvoidyi* still exists in the Paris

Museum and is herein designated as lectotype (see p. 119); the lectotype is in rather poor condition (some mould, holes in body, a mid and a fore leg missing) but it shows the bare parafacials, three postalar setae, haired suprasquamal ridge, entirely reddish yellow legs, brown abdomen with darkened hind margins to the segments, yellowish pleural hair, and same form of chaetotaxy, and is considered undoubtedly conspecific with the neotype of *vivipara*. Hence *desvoidyi* Guérin-Méneville is here placed as a new synonym of *vivipara* Fabricius, and it is concluded that *vivipara* of Robineau-Desvoidy (1830) (= *desvoidyi* according to Guérin-Méneville) is actually therefore the same species as *vivipara* Fabricius and not a misidentification as Guérin-Méneville supposed. Consequently there is no longer any confusion over the type-species of *Rutilia*: *Tachina vivipara* Fabricius is an originally included nominal species, correctly identified by Robineau-Desvoidy, and fixed as type-species of the genus by subsequent designation of Crosskey (1967 : 26).

*Tachina vivipara* Fabricius is also type-species by original designation of *Stiraulax* Enderlein, and this name thus falls as a junior objective synonym of *Rutilia* Robineau-Desvoidy. One other name enters into junior synonymy with *Rutilia* s.str., namely *Psaroniella* Enderlein, the type-species of which was cited by Enderlein (1936 : 417) as *castanipes* Bigot; but Enderlein misidentified *Rutilia castanipes* Bigot (which belongs in subgenus *Donovanius*, the name a synonym of *inusta* Wiedemann) and the single specimen from Gippsland, Victoria, that he cited belongs to *Rutilia* (*Rutilia*) *setosa* Macquart, and the generic name *Psaroniella* is therefore a synonym of *Rutilia* s.str. and not of *Donovanius*. (The ♀ specimen identified as *castanipes* by Enderlein is in MNHU collection, Berlin, and has been examined: it is labelled 'Koonwarra Gippsland, Victoria' and has a determination label in Enderlein's hand reading 'Psaroniella castanipes (Big. 1880) ♀ Dr Enderlein det. 1936'.)

*Rutilia* s.str. contains only a small number of species, and although the typical group of the genus in a nomenclatorial sense is not very representative of the wide range of forms included in the genus as a whole. The rather strongly developed ventral marginal bristling of the abdominal tergites, especially in *vivipara* itself, sets the subgenus rather apart from all the other *Rutilia*, and the possession of only three strong setae on the postalar callus makes the included forms rather obviously different from superficially similar large brown forms with depressed tip to the abdomen found in the subgenus *Donovanius*. In *vivipara* the abdominal chaetotaxy is more strongly spiniform than in all other *Rutilia* s.l. and the marginal setae of the ventral ends of the tergites are so strong and stiff that they simulate the similar very strong setae found in *Formosia*; but whereas in *Formosia* the bristles of the tergite venters are directed almost straight downwards those of *R. vivipara* are directed backwards or mainly so (and those of the female are shorter and more stubby than those of the male). The third abdominal tergite in *Rutilia* s.str. has unusually well developed median marginal setae, which often enable specimens of the subgenus to be distinguished at once from other subgenera. Normally the T<sub>3</sub> median marginals form a transverse row of about six to a dozen erect setae, the row bowing forwards near the centre so that the middle one or two pairs of marginal bristles are not close to the hind edge of the tergite like the rest (and are therefore less truly *marginal*);



in other subgenera median marginal setae are normally absent on T<sub>3</sub> or represented by only a single fine pair.

*Rutilia* s.str. is most easily distinguished from *Chryсорutilia*, *Donovanius* and *Ameniamima*, by the possession of only three instead of four or more setae on the postalar callus, and from *Chryсорutilia* and *Ameniamima* by the absence of pteropleural hairing in front of the posterior sternopleural seta. It differs also from *Chryсорutilia* and *Donovanius* by lacking a long hind tibial fringe (though a short one is present in *confusa*), and usually by having two distinct *pd* setae on the hind tibia. The depression in the last abdominal tergite, and the presence of two or three strong sternopleural setae, also, separate *Rutilia* s.str. from *Chryсорutilia*.

In species of *Rutilia* s.str. the suprasquamal ridge may be bare or haired (though presence or absence of such hairing seems to be constant within each species). In *vivipara* the ridge is haired, but the hairing is rather short and sparse (as in the species of *Grapholostylum*) instead of very long, dense and crinkly (as in the species of *Donovanius*, *Chryсорutilia*, and *Neorutilia*), a fact which perhaps suggests that the affinities of *Rutilia* s.str. lie more closely with *Grapholostylum* than with any other subgenus, a supposition which is supported by the several other character that *Rutilia* and *Grapholostylum* share in common (among them the three postalars, lack of hind tibial fringe, unusually strong development of the chaetotaxy of the thoracic dorsum, pteropleuron bare in front of the posterior *stpl* seta, and rather similar form of facial carina).

If all the species of *Rutilia* s.str. and *Grapholostylum* are considered it is found that there are one or two species which are rather intermediate and tend to form an interconnecting link between the two subgenera, as discussed in more detail under *Grapholostylum*. One of these, here placed in *Rutilia* s.str., is the aptly named species *confusa* Malloch. This species has the suprasquamal ridge bare and on this account was originally described by Malloch as a *Formosia*, but it has none of the characters of true *Formosia* apart from the bare ridge and is certainly a *Rutilia* in all other respects (just as the species of *Ameniamina* subgen.n. with bare suprasquamal ridge are equally *Rutilia* in the wide sense); but *confusa* has only some 2-4 (rarely more) median marginal setae on abdominal T<sub>3</sub>, has a somewhat shallow median depression in T<sub>5</sub>, and has a definite though short hind tibial fringe, and so differs in these features from *vivipara*; on the other hand, it has rather strong ventral marginal setae on the tergites, colouring very like that of *vivipara*, and the form of 5th abdominal sternite of the male, which all confirm the correct placement of *confusa* in *Rutilia* s.str.

The following points should be noted about the synonymies indicated in the list of included species. The neotype specimen herein designated for *Rutilia durvillei* Robineau-Desvoidy (see p. 124) is conspecific with the neotype of *vivipara*, and *durvillei* therefore goes into synonymy; apart from being justified by what little is known of *durvillei* from the original description it is desirable to dispose of this name as a synonym since it has never been in use for a recognized species. Enderlein (1936 : 430) suggested that *durvillei* was perhaps only a variety of *desvoidyi* (= *vivipara*); the present fixation of the neotype eliminates the name completely as a junior synonym. For *Rutilia inornata* Guérin-Ménéville an original syntype specimen

still exists in Paris Museum and is here designated as lectotype (see p. 119); it has three postalar setae, haired suprasquamal ridge, and all the other features shown by *vivipara* and is believed to be undoubtedly conspecific with the neotype of *vivipara*; hence *inornata* also is placed as a synonym of *vivipara*. (But note that the name *inornata* has been misapplied in the literature to the species that should be called *sabrata* Walker and belongs in *Donovanius*: see further discussion of this under that subgenus.)

INCLUDED SPECIES

- Rutilia (Rutilia) confusa* (Malloch). AUSTRALIA (A.C.T., New South Wales, South Australia, Victoria). [Holotype examined].
- R. (R.) dentata* Crosskey **sp. n.** AUSTRALIA (Victoria). [Holotype examined].
- R. (R.) setosa* Macquart. AUSTRALIA (New South Wales, Victoria). [Neotype examined].
- [*castanipes* Bigot sensu Enderlein, 1936. Misidentification.]
- R. (R.) vivipara* (Fabricius). AUSTRALIA (A.C.T., New South Wales, Queensland, Tasmania, Victoria). [Neotype examined].
- desvoidyi* Guérin-Méneville **syn. n.** [Lectotype examined].
- durvillei* Robineau-Desvoidy **syn. n.** [Neotype examined].
- inornata* Guérin-Méneville **syn. n.** [Lectotype examined].

KEY TO THE SPECIES OF SUBGENUS *RUTILIA*

- 1 Suprasquamal ridge haired . . . . . *R. vivipara*
- Suprasquamal ridge bare . . . . . 2
- 2 Legs entirely reddish yellow. Scutum, especially in ♂, with a dark green tinge to naked eye and with rather inconspicuous presutural vittae. Surstylus of ♂ genitalia shaped as in Text-fig. 55 . . . . . *R. confusa*
- Legs partially dark brown to blackish brown. Scutum not appearing dark green to naked eye, sometimes with coppery violet tinge. Surstylus of ♂ genitalia not of this shape . . . . . 3
- 3 Parafacials entirely haired. Tarsi reddish yellow to reddish and concolorous with tibiae. Surstylus of ♂ genitalia broad basally with an anteromedian toothlike process, deeply excavate between this process and apex (Text-fig. 56) . . . . . *R. dentata* sp. n. (p. 81)
- Parafacials bare or at most only haired at extreme upper ends. Tarsi blackish, much darker than tibiae. Surstylus of ♂ genitalia strongly and evenly tapering to sharp apex (Text-fig. 57) . . . . . *R. setosa*

*Rutilia (Rutilia) dentata* sp. n.

(Text-fig. 56)

[Specific name alludes to a tooth-like process on ♂ surstylus.]

♂. *Head.* Ground colour dark brownish or blackish on occiput and genal dilations and parafrontals, light tawny brownish or reddish on other parts; interfrontal area red-brown; pollinosity yellowish white. Parafrontal hair black, parafacial hair light golden orange (with a few dark hairs intermixed at extreme upper end of parafacial), genal hair pale yellow, occipital hair yellowish white. Vertex 0.13 of head-width. Frontal setae not, or only just, meeting at apices. Gena 0.35-0.39 of eye-height. Parafacial wide, about 3.8 times as wide as third

antennal segment, completely haired. Antennae brownish orange basally, third segment dark brown except for some bright orange-red colour at junction with second segment, falling short of mouth-margin by twice the length of the third segment; third segment about 2.1 times as long as second segment. Palpi tawny brown. *Thorax*. Ground colour brownish or blackish, a little reddish on sides around the sutures of the pleurites; dorsum with dark coppery pink tinge to naked eye, and with traces of greenish yellow reflections under microscope (especially along transverse suture); trace of greenish reflection on sternopleura. All dorsal hair black; hair of pleural regions light yellow to pale golden orange, except for some blackish hairs on the upper and posterior parts of the mesopleura; hair also blackish on sides of humeral calli. Scutellum with 6-7 pairs of marginal setae (apicals included), the apicals as strong as the other marginals. Thoracic chaetotaxy not noticeably spiniform. *Wings*. Basicosta black. Wing membrane nearly clear hyaline, entirely microtrichiate. Calyptrae semi-translucent pale brownish, with pale yellow hair fringe. *Legs*. Reddish or reddish yellow except for some brown to blackish brown darkening on coxae and basally on femora, tarsi concolorous with tibiae. Most of the coxal hair and the long soft posterior hair of the fore and mid femora, also the long hair of the basal anterior surface of the hind femora, pale yellowish; other leg hair black, except for the usual reddish hair on the *a* and *av* surfaces of the fore tibia. Chaetotaxy of mid and hind tibiae variable: mid tibia either without or with one or two minute *ad* setae; hind tibia with short regular inconspicuous *ad* fringe (with or without a distinct *ad* seta submedially in the fringe), and with one or two *pd* setae. Claws long. *Abdomen*. Slightly paler than thorax, dark reddish brown with some darkening of hind margins of intermediate tergites (which appear slightly blackish to naked eye), and with a narrow blackish median line; intermediate tergites with slight coppery purple reflections and with traces of coppery green reflections in some lights; these tergites largely overlaid with very thin whitish pollinosity which is hardly at all visible to naked eye. All abdominal hair black except for a few pale yellowish hairs at extreme base of venter; long hairs and setae of T<sub>5</sub> with reddish apices. T<sub>3</sub> with a row of many median marginal setae, these rather short and slightly stubby. Dorsal hair of T<sub>1</sub> + 2 and T<sub>3</sub> recumbent, that of T<sub>4</sub> semi-recumbent basally but erect distally, hair of T<sub>5</sub> very long and fine and entirely erect. Sternite 5 with each lobe very slightly excavate on apical margin. Genitalia with cerci and surstyli as in Text-fig. 56; surstylus of unusual form, very broad basally and with a blunt prong or tooth-like process on anterior edge submedially, excavate between this tooth and the apex, and bearing some extraordinary multifid setae on inner surface directed inwards. *Measurements*. Large species, body length about 16-18 mm, wing length about 15-17 mm.

♀. Generally similar to ♂ except that the abdomen is much more black and has the whitish pollinosity of the intermediate tergites much more conspicuous, purplish reflections less noticeable. Some pale yellow hair present on notopleural swellings and on extreme sides of scutum (below supra-alar setae). Frons with one pair of well developed proclinate orbital setae. Vertex 0.23-0.25 of head-width. Size as in ♂.

#### MATERIAL EXAMINED

Holotype ♂, AUSTRALIA: Victoria, Monbulk. In British Museum (Natural History), London.

Paratypes. AUSTRALIA: 1 ♂, 2 ♀, same data as holotype (one ♀ with year date '1895' on label in addition to words 'Monbulk Victoria'). 1 ♀, Victoria, Grampians, Reed's Lookout, 23.xii.1953 (*B. McMillan*). All paratypes in British Museum (Natural History).

DISTRIBUTION. Known only from south-eastern Australia.

AFFINITIES. Closely allied to other species of *Rutilia* s.str. and perhaps most closely to *R. (R.) setosa* Macquart, from which it differs most notably in the key characters cited above. The genitalia, with their remarkable form of surstyli, are



most distinctive, and no other Rutiline is known in which a surstylus of this shape occurs (Text-fig. 56) or in which the genitalia have strong setae with divided apices.

### Subgenus *GRAPHOLOSTYLUM* Macquart stat. n.

*Grapholostylum* Macquart, 1851 : 196 (223). Type-species: *Grapholostylum dorsomaculatum* Macquart, 1851, by monotypy.

*Agalmia* Enderlein, 1936 : 433. Type-species: *Rutilia albopicta* Thomson, 1869 [= *Grapholostylum dorsomaculatum* Macquart, 1851], by original designation. **Syn. n.** [Junior homonym preoccupied by *Agalmia* Enderlein, 1934 (Muscidae)].

**DIAGNOSIS.** Parafrontals pollinose, not metallic. Epistome and genae not metallic. Facial carina slightly flattened to strongly convex on anterior surface, outline convex in profile and sharply distinguished from lunula; epistome prominent. Parafacials bare or haired. ♀ proclinate orbital setae usually absent, at most one pair (sometimes present one side and absent the other). Arista long-pubescent to short-plumose. Humeral callus with 4 setae, usually well developed. Posthumeral setae one or two. One very strong *post ia* seta [one specimen seen with small second *post ia*]. Scutum without supernumerary prescutellar setae. Postalar callus with three strong setae. Suprasquamal ridge haired. Scutellum convex dorsally without flattening towards apex; 4-6 pairs of marginal setae; with row of well developed preapical setae before the marginals. Pteropleuron not haired in front of level of posterior sternopleural seta. Two strong sternopleural setae (1 + 1) [one specimen seen with small second anterior *stpl*]. Prosternum bare; prosternal membrane bare or sparsely haired (variable in same species). Hind tibia without anterodorsal fringe, usually two distinct *ad* setae and two or three *pd* setae. Last abdominal tergite without median depression, evenly convex across its width and sides strongly tapering posteriorly (hypopygium prominent and well visible in profile). T<sub>3</sub> without median marginal setae or with one pair or with a transverse row of semi-erect small median marginals developed to variable extent; T<sub>3</sub> with lateral marginal setae. T<sub>5</sub> with some long fine erect discal setae (often irregular in ♂ but tending to form transverse preapical row in ♀). Sternite 5 of ♂ acuminate posterolaterally and with a submedian pair of conspicuous downwardly directed prominences (Text-fig. 33), these visible in situ in profile. ♂ genitalia with apical membranous part of distiphallus whip-like, exceptionally long and slender (about twice as long as sclerotized basal part of distiphallus: Text-fig. 38), surstyli long and narrow and cerci longer than surstyli (Text-fig. 64). [Medium-sized to large species with white pollinose spots over mesopleura and sternopleura and often with white pollinose spots distinguishable over humeral calli to notopleura and in supra-alar areas].

**DISTRIBUTION.** Eastern Australia from Tasmania to Queensland.

**DISCUSSION.** *Grapholostylum* was originally described by Macquart (1851) as a genus allied to *Rutilia* having one included species, viz. *G. dorsomaculatum*. For many years the identity of Macquart's genus remained enigmatic, but Townsend (1932 : 38; 1936 : 153; 1938 : 416) rightly showed that *Grapholostylum* is a true Rutiline. Regrettably, Enderlein (1936 : 441), guessing from the description of Macquart and overlooking Townsend's (1932) paper, decided that the genus belonged to the Ameniinae and placed it near *Amenia* Robineau-Desvoidy—a rather bad case of misidentification, which was corrected by Crosskey (1965 : 103-106), who showed that the misidentified *G. dorsomaculatum* sensu Enderlein is actually *Amenia sexpunctata* Malloch. For the present work Macquart's type-material of *G. dorsomaculatum* (including the lectotype designated elsewhere: Crosskey (1971 : 271)) has been studied in detail and Townsend's placement in the Rutiliini found to be correct; it should be emphasized, however, that the name applies to a valid species

and is *not* a synonym either of *Rutilia decora* Guérin-Méneville or of *R. splendida* (Donovan) as Townsend stated (1932 : 38-39; 1938 : 416). On the other hand, the name is a senior synonym of *Rutilia albopicta* Thomson (syn. n.), the type-species designated by Enderlein (1936) for his genus *Agalmia*, and because of this specific synonymy the generic name *Agalmia* Enderlein, 1936, is a new synonym of *Grapholostylum* Macquart. (Here it should be noted that *Agalmia* of Enderlein (1936) in the Rutiliini is a junior homonym of *Agalmia* Enderlein (1934) in the Muscidae; no replacement name is needed as *Agalmia* Enderlein, 1936, is itself a synonym.)

*Grapholostylum*, as here redefined as a subgenus within *Rutilia* s.l., contains a small number of species that are very distinctive in the ♂ fifth sternite and ♂ hypopygial characters but which do not differ very strikingly on their other characters from certain other *Rutilia*. Certainly on the features of head form, chaetotaxy, arisal hairing, and abdominal shape the subgenus shares many characters in common with the subgenus *Microrutilia* Townsend, and in the presence of a well formed transverse row of median marginal setae on T<sub>3</sub> there is a marked resemblance between one of the species of *Grapholostylum*, viz. *subtustomentosa*, and the subgenus *Rutilia* s.str. However, *subtustomentosa* has the ♂ sternite 5 and hypopygial characters exactly as in *dorsomaculata* (I can find no real differences at all between the genitalia of the two species), and *subtustomentosa* is assignable to subgenus *Grapholostylum* and not to *Rutilia* s.str.

Sternite 5 in the male in this subgenus is shaped as in Text-fig. 33; the sides of the sternite are drawn out to sharp points and there is a pair of large blunt downwardly directed submedian lobes with a deep narrow cleft between them. The submedian prominences are easily visible on the abdomen when seen in situ and project conspicuously in profile; the hind margin of the sternite is clearly excavate between the submedian prominence and the lateral extremity of the sternite. A ♂ sternite 5 of this form occurs nowhere else in the Rutiliini, and therefore makes *Grapholostylum* an especially distinctive segregate.

The aedeagus in *Grapholostylum* differs from that of all other subgeneric segregates of *Rutilia* s.l. The membranous distal section of the distiphallus is exceptionally long and slender, rather whip-like (Text-fig. 38), and about twice as long as the sclerotized proximal section (which is of normal length); in other *Rutilia* s.l. the distal section of the distiphallus is either shorter than, or about subequal in length to, the proximal section. Species of subgenus *Grapholostylum* have, in fact, the most elongate form of aedeagus found in the Rutiliini. Another slight difference in the aedeagus between *Grapholostylum* and other *Rutilia* subgenera lies in the shape of the epiphallus: in *Grapholostylum* the epiphallus, seen in profile, is widest well beyond the junction of the distiphallus (Text-fig. 38), whereas in other subgenera the epiphallus is widest at its base (i.e. near the junction with the distiphallus) and contracts thence towards its apex (Text-fig. 37).

Apart from the genital differences, *Grapholostylum* differs from *Rutilia* s.str. by lacking a median dorsal excavation in the last visible abdominal tergite (T<sub>5</sub>) and by having a convex scutellum which lacks any definite flattening before the apex. Differences between *Grapholostylum* and *Microrutilia* are discussed under the latter subgenus.

The type-species, *R. (G.) dorsomaculata*, of this subgenus has white pollinose markings on thorax and abdomen (to which Macquart's name refers), but in general the spots are less bold and obvious than those found in the subgenus *Ameniamima* (q.v.), though they are mainly developed at the same sites—in humeral, supra-alar, mesopleural and sternopleural positions. The white spots give *dorsomaculata* and *albovirida* (the latter is possibly not specifically distinct from the former) some superficial resemblance to *Ameniamima* species, but *Grapholostylum* differs much from *Ameniamima* on the genital features already noted and by having three postalar setae (four in *Ameniamima*) and a haired suprasquamal ridge (bare in *Ameniamima*).

The size and colouring in *dorsomaculata* are rather variable, females ranging from bright green to dark blackish green with coppery tinges, and males having a light tawny brown abdomen with broad black median vitta. All specimens, however, have the white pollinose markings on the thorax and less obvious white pollinose areas (somewhat shifting in appearance) on the abdomen; the thoracic pattern appears always to include a pair of small submedian white spots medially on the scutum just in front of the scutellum (spots in this position do not occur in *Ameniamima* but are found in some of the Ameniine Calliphorids of the genus *Amenia* Robineau-Desvoidy, which slightly resemble the brighter green specimens of *Grapholostylum* species). As a result of the variability, and because earlier authors misunderstood Macquart's species, *dorsomaculata* has several synonyms (which are here newly established after examination of types). Malloch's species *Rutilia albovirida*, described from the female, is probably the same as *dorsomaculata* but at present there is insufficient evidence to establish definite synonymy.

*Rutilia micans* Malloch belongs in this subgenus and is rather intermediate between *dorsomaculata* and *subtustomentosa* in hair colour and degree of development of the white pollinose spots (the pattern of these is identical to *dorsomaculata* but they are less conspicuous in *micans*).

#### INCLUDED SPECIES

- Rutilia (Grapholostylum) albovirida* Malloch. AUSTRALIA (Queensland). [Holotype examined].
- R. (G.) dorsomaculata* (Macquart). AUSTRALIA (New South Wales). [Lectotype examined].
- albopicta* Thomson **syn. n.** [Holotype examined].
- fuscisquama* Malloch **syn. n.** [Holotype examined].
- leucosticta* Schiner **syn. n.** [Holotype examined].
- variegata* Bigot **syn. n.** [Lectotype examined].
- R. (G.) micans* Malloch. AUSTRALIA (Australian Capital Territory, New South Wales). [Holotype examined].
- R. (G.) subtustomentosa* Macquart. AUSTRALIA (Tasmania). [Holotype examined].
- velutina* Bigot **syn. n.** [Lectotype examined].

#### KEY TO SPECIES OF THE SUBGENUS *GRAPHOLOSTYLUM*

- 1 Entire vestiture of the fore coxae orange or golden red. Bristling of fore femora red.



- Prostigmatic and propleural setae red. All mesopleural hair and pteropleural vestiture yellow or golden orange. Scutum without submedian white spots. Mesonotum extensively tinged with light mauve-pink colour. Abdomen of both sexes with transverse row of many small median marginal setae on T<sub>3</sub>. ♀ abdomen without white spots. [Tasmania] . . . . . *R. subtustomentosa*
- Vestiture of fore coxae all black or with at least the main bristling black. Bristling of fore femora black. Prostigmatic and propleural setae black. Mesopleural hair partly or completely black, pteropleural vestiture partly black (at least the strongest hairs black). Scutum with a pair of submedian white pollinose spots (in addition to supra-alar pair), sometimes faintly marked. Mesonotum not extensively mauve-pink, sometimes coppery pink in prescutellar area. Abdomen normally without or with only one pair of median marginal setae on T<sub>3</sub> (occasional specimen with row of four or five such setae developed). ♀ abdomen with some diffuse white pollinose spots, usually including a pair of submedian spots on each intermediate tergite (sometimes only visible as fly is turned) . . . . . 2
- 2 Hair of sternopleuron pale yellow. Hair of abdominal venter entirely pale yellow (♂) or pale yellow ventrally on T<sub>1</sub> + 2 and T<sub>3</sub> (♀). Hair of coxae partly or mainly orange or golden red. At least some of mesopleural hair yellow. [A.C.T. and New South Wales] . . . . . *R. micans*
- Hair of sternopleuron entirely or mainly black. Hair of entire abdominal venter black (both sexes). Hair of coxae entirely or almost entirely black. All mesopleural hair black . . . . . 3
- 3 Size smaller, length 10-12 mm. Mesonotum brilliant metallic emerald-green or golden green, without noticeable darker vittae when seen by naked eye. Lower half of postorbit bright golden orange or yellow and upper part silvery white, transition of the colouring rather abrupt. [Queensland] . . . . . *R. albovirida*  
 [Only known from ♀, possibly not specifically distinct from *dorsomaculata*]
- Size larger, length 12-18 mm. Mesonotum not brilliantly shining, sometimes green but more often very dark olive-green to greenish brown and with some darkish vittae evident to naked eye. Upper half of postorbit pale yellowish and not strongly contrasting in colour with yellow or orange-yellow lower half, if upper part rather white then normally not abruptly contrasted in colour with lower part (transition of colouring more gradual). [New South Wales] . . . . . *R. dorsomaculata*

### Subgenus *MICRORUTILIA* Townsend

*Microrutilia* Townsend, 1915 : 23. Type-species: *Rutilia minor* Macquart, 1846, by original designation.

*Prosenostoma* Townsend, 1932 : 39. Type-species: *Senostoma flavipes* Brauer & Bergenstamm sensu Townsend (misidentification) [= *Rutilia (Senostoma) hirticeps* Malloch], by original designation. **Syn. n.**

*Eucompsa* Enderlein, 1936 : 400. Type-species: *Rutilia minor* Macquart, 1846, by original designation. [Isogenotypic synonym of *Microrutilia* Townsend and junior homonym preoccupied by *Eucompsa* Enderlein, 1922 (Tabanidae)].

*Pogonagalmia* Enderlein, 1936 : 435. Type-species: *Rutilia (Senostoma) hirticeps* Malloch, 1929, by original designation. **Syn. n.**  
 [*Senostoma* sensu authors, not Macquart. Misidentification.]

DIAGNOSIS. Parafrontals pollinose or almost completely so, at most only metallic at extreme upper ends in ♀. Epistome and genae not metallic. Facial carina convex on anterior surface, and strongly convex and well marked off from lunula in profile, upper part often very bulbous; epistome strongly nasute. Parafacials bare or haired. ♀ proclinate orbital setae in one or two pairs, rarely absent. Arista long-pubescent to short-plumose. Humeral callus with 4 setae, rather strong. One or two posthumeral setae. Normally two strong *post ia* setae, occasionally

only one in ♂, sometimes small third seta in front of main pair. Scutum without supernumerary prescutellar setae. Postalar callus with three strong setae. Suprasquamal ridge haired. Scutellum convex, not at all flattened before apex; 4-5 pairs of marginal setae (occasional specimen with three only on one side); with row of preapical setae in front of marginals. Pteropleuron not haired in front of level of posterior sternopleural seta. Two or three sternopleural setae (1 + 1 or 2 + 1). Prosternum bare; prosternal membrane normally bare, rarely one or two hairs. Hind tibia with short fringe or with irregular sparse long fringe, with one main *ad* seta if fringe close-set but otherwise with several distinct *ad* setae, with three *pd* setae (occasionally more). Last abdominal tergite without median depression, evenly convex across its width and sides strongly tapering posteriorly, hypopygium very prominent. T<sub>3</sub> without median marginals or with a few weakly developed; T<sub>3</sub> with lateral marginal setae. T<sub>5</sub> with long erect discal setae. Sternite 5 of ♂ downwardly prominent and conspicuous in profile, each lobe angulate posterolaterally (Text-fig. 32) and very slightly concave on its hind margin. ♂ genitalia with distal membranous part of distiphallus shorter than sclerotized proximal part, surstyli broad basally and slightly tapering to blunt end (Text-figs 60-63), sharply pointed at tip in *nigriceps*. [Small or very small species of coppery green, emerald, or blue-green colour in which scutellum often violaceous and male often with tawny yellow abdomen showing black median vitta and cupreous or green tinges to ground-colour].

**DISTRIBUTION.** Eastern Australia from Tasmania to Queensland, probably also Western Australia.

**DISCUSSION.** This subgenus is aptly named for, as redefined here, it still contains the smallest species of *Rutilia* s.l., and *R. (M.) minor*—the type-species—is the smallest of all Rutiliini (as little in some specimens as 6-7 mm long). Enderlein (1936) erected the genus *Eucompsa* for *R. minor*, but evidently realized before final publication of his paper that Townsend (1915) had already proposed the genus *Microrutilia* for the same species: thus *Eucompsa* is proposed on p. 400 of Enderlein's (1936) work and promptly sunk into synonymy with *Microrutilia* on p. 415 of the same work. Apart from being a junior isogenotypic synonym the name *Eucompsa* Enderlein, 1936, is also a junior homonym of one of Enderlein's own generic names, being preoccupied by Enderlein's (1922) use of *Eucompsa* in the Tabanidae. Even for Enderlein it was unusually careless nomenclature to publish a junior objective synonym and a junior homonym in the same name.

The type-species of *Pogonagalmia* Enderlein, namely *R. hirticeps* Malloch, differs from typical *Microrutilia* only in having the parafacials haired and in slight shape differences (considered specific only) in the ♂ cerci and surstyli, and none of these distinctions would justify separating *hirticeps* from *Microrutilia*; *hirticeps* is here considered to be consubgeneric with *minor* and the genus-group name *Pogonagalmia* therefore goes into synonymy with *Microrutilia*.

Townsend's generic name *Prosenostoma* is based upon a misidentification of Brauer & Bergenstamm's species *Senostoma flavipes*, and Townsend's (1932 : 39; 1938 : 420) *flavipes* (described in the *Manual of Myiology* as having haired parafacials) is the species *hirticeps* Malloch. The true *flavipes* Brauer & Bergenstamm has bare parafacials, and is a quite different species. However, both Brauer & Bergenstamm's true *flavipes* and Townsend's misidentified *flavipes* (= *hirticeps*) are here treated as consubgeneric, and no nomenclatural difficulty arises from Townsend's misuse of the name *flavipes*: *Prosenostoma* enters into new synonymy with *Microrutilia*.

Townsend's error arose from mis-recognition of the types of *flavipes*. *Senostoma flavipes* was described by Brauer & Bergenstamm (1889 : 126) from a ♂ and a ♀ specimen from 'Neu Holland' and Engel (1925 : 375) recorded these specimens as 'Typen No. 38 u. 39'. At the same time Engel noted that the Vienna Museum contained two ♀ specimens collected by Thorey in Western Australia in 1864; it was these specimens that Townsend wrongly considered to be the types of *flavipes* Brauer & Bergenstamm. In his 1932 work, in which the name *Prosenostoma* was proposed, Townsend recorded a 'Female Ht [holotype] in Wien, labelled "Thorey: 1864: Austra. occid."' and in the 1938 work (*Manual of Myiology*, 7 : 420) he again recorded 'Ht female from West Australia, in Vienna'; Townsend's notes in the United States National Museum, Washington, show that there were two specimens, both ♀, with the data 'Thorey 1864 Austra. occid.', one being his 'holotype' in Vienna and the other a specimen taken by Townsend from the Vienna collection for his own genotype collection (the specimen that Townsend obtained from Vienna is still in U.S.N.M. and has been examined). The two ♀ specimens from Western Australia mentioned by Townsend in his notes (one his supposed holotype) are the same two ♀ as Engel had recorded as ordinary specimens without type-status. The true *flavipes* types are the specimens recorded by Engel as 'Typen' from 'Neu Holland'; these have the parafacials bare and are a different species from the 'Thorey 1864 Austra. occid.' females, apparently being specimens of *R. (M.) hirticeps* Malloch. A lectotype is designated from the true type-material of *flavipes* elsewhere in this paper (see p. 121). Comparison of this specimen with the lectotype of *fulviventris* Bigot shows that *flavipes* must fall as a synonymy of *fulviventris*.

Brauer & Bergenstamm (1889) completely misunderstood Macquart's genus *Senostoma* (type-species *S. variegata* Macquart), which is not even a Rutiliine (Paramonov, 1968 : 384; Crosskey, 1971 : 291), and were seriously in error to place *flavipes* in this genus. In reality it belongs to the genus-group segregate later described by Townsend as *Microrutilia*. Unfortunately both Engel (1925 : 374) and Malloch (1929 : 305, 1930 : 109) followed Brauer & Bergenstamm's erroneous interpretation of *Senostoma*, and applied the name *Senostoma* to the concept which should correctly be called *Microrutilia*; hence the entry of *Senostoma* of authors, not Macquart, in the foregoing synonymy of *Microrutilia*.

*Microrutilia* is an easily recognized subgenus because of the combination of small size, three postalar setae, conspicuously haired arista, very prominent nasute epistome and bulbous facial carina, and in the male the unusually prominent sternite 5 and hypopygium. It appears to be most closely related to *Grapholostylum* with which it shares a large number of characters (compare diagnoses), and it is possible that new species discovered in the future may show intermediate characters making it necessary to amalgamate the two subgenera. At present *Microrutilia* is easily distinguished from *Grapholostylum* by the differently formed ♂ sternite 5 (Text-fig. 32) and by the short membranous distal part of the aedeagus (which is shorter than the sclerotized proximal part); other differences include the lack of white spotting on thorax, the presence normally of two posterior intra-alar setae (though there is variability and some specimens of *Microrutilia* have only a single *post ia* seta as in *Grapholostylum*), and the more strongly developed proclinate orbital bristling (nor-



mally two pairs in *Microrutilia* females and one or none in *Grapholostylum*) and sternopleural bristling (commonly 2 + 1 sternopleurals in *Microrutilia* and almost always only 1 + 1 in *Grapholostylum*).

An interesting feature of the chaetotaxy of *Microrutilia* (apart from the unusually long and strong bristles) is the constancy of the posterior dorsocentral setae. In most *Rutilia* s.l. the number of *post dc* is rather variable within species, and therefore within any particular subgenus, and the degree of development may differ between sexes or on one side of the scutum from the other in the same specimen, but in *Microrutilia* there are very constantly four long strong *post dc* setae regularly spaced (as they would be in a higher Tachinid with this number of *post dc* setae); the same constancy of four unusually long strong *post dc* setae (combined with four rather strongly developed humeral setae) occurs in *Grapholostylum*, and perhaps is another indicator of close phyletic relationship between the two subgenera in spite of the rather different male sexual characters of *Microrutilia* and *Grapholostylum*.

Some species of *Microrutilia* have a superficial resemblance to some *Chryсорutilia* species because of their metallic green upper occiput and postbuccae, and because of the very convex non-sulcate end of the abdomen (T5); but the presence of three postalar setae (instead of 4 or 5 as in *Chryсорutilia*), the lack of pteropleural hair anterior to the *post stpl* seta, and the short sparse hairing of the suprasquamal ridge (contrasted with the long dense bushy hairing of *Chryсорutilia*) readily distinguishes *Microrutilia* from *Chryсорutilia*. In *Microrutilia*, also, there are strong erect setae present among the hair of abdominal T5, whereas in almost all *Chryсорutilia* species this tergite bears fine hair only. The shape of the ♂ sternite 5 is also different in the two subgenera.

Correct association of the sexes in *Microrutilia* is especially difficult, particularly as the males and females of many if not most of the species (*hirticeps* is an exception) appear to be sexually dimorphic in leg colour; females have the legs reddish yellow, but males have the legs partly or completely darkened (mainly black or brownish black at least on the coxae, parts of the femora and the tarsi). Some of the nominal species in the subgenus are based on ♂ primary types and others on ♀ types, and it is well-nigh impossible at present (in the absence of bred material or good series collected in the same place at the same time) to be sure how the females correlate with the males; it is almost certain, though, that some of the names involved are synonyms of each other. Some authors have already established synonymies based on guess-work correlations: Brauer (1899 : 513) placed *flavipes* as a synonym of *minor*; Austen (1907 : 345) placed *liris* as a synonym of *minor*; Engel (1925 : 374) placed *flavipes* as a synonym of *ruficornis*; and Townsend (1938) accepted Austen's and Engel's synonymies. During the present work it has been found that there is a very difficult complex of species involved that are all very closely alike, though differing on male genitalia, and that it is almost impossible to say which females associate with the different species recognizable on male genitalia. Although at least one of the previously established synonymies is almost certainly correct, viz. that of *liris* with *minor*, it seems best to regard all the names based upon female types as valid for distinct species until such time as really good evidence is available for positive association of males and females; in the absence of such evidence I here

cite the relevant names as valid in the list of included species and in the key to species.

An interesting feature of most *Microrutilia* species is the relatively large size of the epandrium of the ♂ hypopygium and its exceptionally rotund form; this is well seen, for example, in Text-fig. 62, showing the apical view of the epandrium of *R. minor*. The large epandrium tends to make the genitalia appear very prominent when in situ, an appearance enhanced by the unusually prominent ♂ sternite 5.

#### INCLUDED SPECIES

- Rutilia (Microrutilia) cupreiventris*** Malloch **stat. n.** AUSTRALIA (New South Wales). [Holotype examined].
- R. (M.) fulviventris*** Bigot. AUSTRALIA ('New Holland', Tasmania). [Lectotype examined].
- flavipes* (Brauer & Bergenstamm) **syn. n.** [Lectotype examined].
- R. (M.) hirticeps*** Malloch. AUSTRALIA (New South Wales, Victoria, Western Australia). [Holotype examined].
- pallens* Curran **syn. n.** [Holotype examined].
- [*flavipes* Brauer & Bergenstamm sensu Townsend. Misidentification.]
- R. (M.) liris*** (Walker). AUSTRALIA (Tasmania). [Holotype examined].
- R. (M.) media*** Macquart. AUSTRALIA (Tasmania to New South Wales). [Lectotype examined].
- ruficornis* (Macquart) **syn. n.** [Holotype examined].
- R. (M.) minor*** Macquart. AUSTRALIA (Tasmania). [Lectotype examined].
- R. (M.) nigriceps*** Malloch. AUSTRALIA (New South Wales). [Holotype examined].
- R. (M.) nigripes*** (Enderlein) **comb. n.** AUSTRALIA (A.C.T., QUEENSLAND). [Lectotype examined].

#### KEY TO SPECIES OF THE SUBGENUS *MICRORUTILIA*

[*Note*: Only a small number of female specimens has been available, and some of the key characters given for females may not be found to be constant with longer series.]

- |   |   |                               |
|---|---|-------------------------------|
| 1 | Parafacials completely haired. ♂ surstyli and cerci as in Text-fig. 63. Legs of both sexes entirely reddish yellow . . . . .  | <b><i>R. hirticeps</i></b>    |
| - | Parafacials bare. ♂ surstyli and cerci differently shaped. Legs mainly blackish brown in ♂, reddish yellow with dark tarsi in ♀. . . . .  | 2                             |
| 2 | Femora reddish yellow (♀♀) . . . . .  | 3                             |
| - | Femora blackish brown, at most a little reddish basally (♂♂) . . . . .  | 6                             |
| 3 | Abdomen bicolorous, dark green to greenish black dorsally and yellow-orange on most of venter; last abdominal tergite (T <sub>5</sub> ) covered with thick whitish pollinosity and therefore contrasting in colour with remainder of abdominal dorsum. Pleural regions reddish yellow with only slight golden green and violaceous metallic glints. Mesopleural hair pale yellow (except for a few dark hairs anterodorsally) |                               |
|   |   | <b><i>R. fulviventris</i></b> |
| - | Abdomen unicolorous, golden green or emerald or cupreous green on both dorsum and venter; last visible tergite not noticeably pollinose, therefore shining like remainder of abdomen. Pleural regions mainly metallic golden green or blue-green. Hair of mesopleuron black (except for some pale hair along extreme anterior edge) . . . . .   | 4                             |
| 4 | Basicosta bright orange. Parafrontals not metallic at upper ends. Sternopleural   |                               |

hair pale yellow. Abdomen partly cupreous. Proclinate orbital setae in one pair only or none definitely developed. 1 + 1 sternopleural setae

[Possibly the ♀ of *R. media*]

*R. cupreiventris*

- Basicosta blackish brown or at least dark brown anteriorly. Parafrontals showing metallic green colour at upper ends on to vertex. Sternopleuron with hair entirely black or black on upper part around and between the *stpl* setae. Abdomen all golden green or emerald. Two pairs of strongly developed proclinate orbital setae. Normally 2 + 1 *stpl* setae (occasionally only 1 + 1) . . . . . 5

- 5 Abdominal tergites 3 and 4 without discal setae and with entirely recumbent hair; T<sub>3</sub> without median marginal setae. Sternopleural hair all black. Ground colour of lower parts of parafrontals reddish and not noticeably contrasting in any light with the reddish yellow ground colour of parafacials. Setae of the upper part of the postocular row short and straight . . . . . Undetermined sp.

[Possibly the ♀ of *R. nigripes*]

- Abdominal tergites 3 and 4 with some long fine irregular discal setae distinctly developed among the hair, the hair sub-erect medially on T<sub>3</sub> and erect all over T<sub>4</sub>; T<sub>3</sub> with a row of about four long fine median marginal setae. Sternopleural hair black around and between the *stpl* setae but pale yellowish on mid part of sternopleuron. Ground colour of parafrontals blackish and in some lights contrasting rather abruptly with reddish yellow ground colour of parafacials. Setae of the upper part of the postocular row rather long and fine and curved slightly forwards . . . . . *R. litris*

[Probably the ♀ of *R. minor*]

- 6 Hair of pleural regions and abdominal venter pale yellow. Hair of fore coxae mainly golden . . . . . Undetermined sp. or spp.

[Possibly ♂ of *R. fulviventris*. ♂ genitalia similar to *R. nigripes*. Specimens from Queensland have extremely narrow upper frons as in *nigripes*, measuring 0.05-0.06 of head-width. Other specimens from Victoria have frons at narrowest from 0.065-0.08 of head-width. Queensland specimens belong to *R. ruficornis* sensu Enderlein, not Macquart. They may possibly be a colour polymorph of *nigripes*.]

- Hair of pleural regions and abdominal venter almost all black. Hair of fore coxae black (at most a few golden hairs at extreme base and apex) . . . . . 7
- 7 Ground colour of parafrontals entirely blackish. Very small species (length 6-9 mm) with exceptionally long fine bristling and hairing. ♂ surstyli and cerci as in Text-fig. 62 or Text-fig. 109 . . . . . 8

- Ground colour of parafrontals tawny reddish or brownish, at most only a little blackish at upper ends. Larger species (length 9.5-15 mm) with vestiture not exceptionally long and fine. ♂ surstyli and cerci of different shape (Text-figs 60 & 61) . . . . . 9

- 8 Ground colour of parafacials blackish and concolorous with parafrontals. ♂ surstyli and cerci as in Text-fig. 109, surstyli with sharp apical point and cerci sinuous in profile. Frons at narrowest point distinctly wider than third antennal segment

*R. nigriceps*

- Ground colour of parafacials yellow and rather sharply contrasting with the blackish parafrontals. ♂ surstyli and cerci as in Text-fig. 62, surstyli rounded apically and cerci straight in profile. Frons at narrowest point subequal in width to or very slightly narrower than third antennal segment . . . . . *R. minor*

- 9 Eyes exceptionally strongly approximated, interfrontal area almost completely obliterated at its upper end, frons at narrowest point only 0.05-0.06 of head-width. ♂ genitalia with free apical parts of cerci not much longer than the contiguous basal parts, and the outer margins of the bases of the cerci rounded (Text-fig. 61). [Queensland] . . . . . *R. nigripes*

- Eyes less strongly approximated, upper part of interfrontal area narrow but distinct, frons at narrowest point 0.075-0.08 of head-width. ♂ genitalia with exceptionally



large heavy cerci (Text-fig. 60) in which the free apical parts are much longer than the contiguous basal midline of the cerci; the outer margins of the basal parts of the cerci rather straight. [Tasmania and New South Wales] . . . . *R. media*

SUBGENERALLY UNPLACED SPECIES-GROUP TAXA IN *RUTILIA* S.L.

These are two, *micropalpis* Malloch, 1929 and *scutellata* Enderlein, 1936. Each is briefly discussed below.

*Rutilia micropalpis* Malloch

This little-known species differs from all other species of *Rutilia* s.l. so far described by having the palpi (as the appropriate specific name indicates) exceptionally small; they are very inconspicuous in the buccal cavity and their length is at most only about half the normal palpal length in *Rutilia*. I would not exclude the species from any named subgenus on this character alone, but on the basis of all the other characters shown by *micropalpis* in combination it is impossible to place the species at all satisfactorily in any one of the seven subgenera here recognized, and it seems best to leave *micropalpis* subgenerically unplaced for the time being. The male is unknown to me, and so far I have seen only four female specimens (holotype and paratype in Australian Museum and two specimens in British Museum (Natural History)). Other than the palpal character these are the features shown by *micropalpis*:

Head pollinose, non-metallic; parafacials bare; ♀ with one pair of strong proclinate orbital setae; arista micropubescent; four humeral setae (one sometimes very weak); one to three post-humeral setae (variable each side on same specimen); two or three *post ia* setae (if three then anterior one very small); no supernumerary prescutellar setae; four or five postalar setae; suprasquamal ridge with short black hair, rather sparse; scutellum convex, with four or five pairs of marginal setae and with well developed preapicals; pteropleuron not haired in advance of hind *stpl* seta; two sternopleural setae (1 + 1, anterior one exceptionally strong); prosternal membrane and anterior edge of prosternum with long pale hair; hind tibia with short very regular and close-set *ad* fringe along its basal three-fifths and with or without one strong *ad* seta inserted at the end of the fringe, with three or four strong *pd* setae; abdominal T<sub>3</sub> with one pair of median marginal setae; T<sub>5</sub> without depression and with a median transverse row of very strong erect setae; body colour dark blackish green with coppery to purplish reflections (mainly on mesonotum and scutellum) and thin whitish pollinosity over humeral area, mesopleuron, and (very thinly) on tergite bases.

If the foregoing list of *micropalpis* characters is compared with the subgeneric diagnoses it is evident that the closest fit lies with subgenus *Donovanius*, though the species fails to conform with typical species of this subgenus by having short sparse suprasquamal ridge hairing, some hair present on the prosternum, by the very short hind tibial fringe and several strong hind tibial *pd* setae, and by the lack of a depression in the last abdominal tergite. *R. micropalpis* seems to combine some of the characters of *Donovanius* with some of *Rutilia* s.str. There is no suggestion, or very little, of any affinity with the other subgenera, even though these possess four or more postalar setae as in *micropalpis*.

It would not be unjustified on the basis of its unusual palpi and combination of other characters to place *micropalpis* in a separate new subgenus, but one is not

proposed at present because the male is still unknown; the male genitalia might well give a better clue to the affinities than any of the female characteristics known so far. If it should prove, as seems possible, that the male of *micropalpis* has genitalia of the *Donovanius* type (with large heavy foliaceous surstyli) then it might be best to assign *micropalpis* to this subgenus in spite of its somewhat aberrant features such as the reduced palpi.

### *Chryсорutilia media* var. *scutellata* Enderlein

This variety was described from a single female (holotype) collected at Adelaide, South Australia, and the description consists of the five words 'Scutellum dunkel rostfarben ohne Metallglanz'. The holotype is probably in the Berlin Museum where it should correctly be located, but was not found there when other Enderlein types were borrowed for this work. In the absence of the type I cannot place the name *scutellata*, but it presumably applies to a species of *Chryсорutilia* (most probably as a synonym). It almost certainly has nothing to do with *media* Macquart, which belongs in the subgenus *Microrutilia* and was clearly misidentified by Enderlein (though specimens named as *media* by Enderlein have not been seen).

### Genus *AMPHIBOLIA* Macquart

*Amphibolia* Macquart, 1843 : 278 (121). Type-species: *Amphibolia valentina* Macquart, 1843, by original designation and monotypy.

DIAGNOSIS. Facial carina widest above middle and distinctly convergent ventrally, rounded on anterior surface, upper part often rather bulbous. Epistome moderately to strongly prominent, face strongly excavate in profile between epistome and carina. Head of ♂ not holoptic, upper eye facets not enlarged, separated by a distance much greater than width of facial carina. Genal dilation well developed. Parafacials haired or bare. Buccal opening normal, very much wider than facial carina. Head pollinose, non-metallic. Arista pubescent. Palpi normal, fully developed. Mentum short and rather broad in profile with subparallel sides. Prosternum bare, prosternal membrane bare or haired. Scutellum with apical pair of setae inserted at lower level than other marginal setae (very rarely absent); total of 4-6 (7) pairs of marginals; disc of scutellum not flattened. Postalar callus with 3-4 setae (occasional specimen with small supernumeraries in addition). Postalar wall bare. Suprasquamal ridge thickly haired. Upper calypter normal. Tegula with normal long wiry posterior setulae. Costal base not explanate. Abdomen with marginal vestiture of tergite venters weak and semi-recumbent (directed backwards), if slightly spiniform (as in *assimilis*) then not directed vertically downwards; T<sub>3</sub> with median marginal setae (often numerous and in strongly developed transverse row); intermediate tergites with discal setae (absent in occasional specimens). T<sub>5</sub> convex above and broadly truncate subconical, without depression or at most with only very slight apicomedian hollowing.

DISTRIBUTION. Australia and Tasmania, Lord Howe Island, New Guinea. Occurring in Australia from Western Australia to Victoria and New South Wales; represented, but apparently poorly, in Queensland.

DISCUSSION. It is by no means certain that *Amphibolia* ought to be considered generically distinct from *Rutilia* s.l., and it is maintained here as a separate genus with considerable doubts as to whether this is fully justified. In the past none of the earlier workers on the Rutiliini have doubted its generic distinctness, but the fact is

that most of the characteristics of *Amphibolia* conform exactly or very closely with those of *Rutilia* in the wide sense and that it is difficult to find really convincing characters for generic separation. The type-species, *A. valentina*, remained for many years the only known species and seemed very distinct from all the *Rutilia* species because of the exceptionally unusual and conspicuous bold black-and-white pattern of the thorax and abdomen, a pattern that elsewhere in the Rutiliini occurred only in the superficially similar species *Formosia speciosa* Erichson; now, however, that more species are known through the work of Paramonov (1950, 1968) it is clear that *valentina* is not nearly so distinctive as it seemed, and that other species of *Amphibolia* such as *A. campbelli* Paramonov, though having the black-and-white pattern, have features of the facies, strength and arrangement of the chaetotaxy and so forth that suggest rather close affinity to, particularly, the segregates *Paramphibolia* and *Chaetogastrina*. The two species contained in these hitherto monotypic genera look very different from *Amphibolia* when arranged in a collection, because they lack the black-and-white pattern, yet they do not differ (apart from pattern) from typical *Amphibolia* on their structural characters to any greater extent than do many of the species of *Rutilia* or *Formosia* differ from their more typical congeners. Considering the range of known species in *Amphibolia*, *Paramphibolia* and *Chaetogastrina* as a whole, therefore, it seems best to treat them in an equivalent manner to the species here placed in *Rutilia* s.l. by merging them into a single genus and widening the generic definition of *Amphibolia* accordingly. But the form of the male hypopygium and fifth sternite which is essentially very similar in *assimilis* and *stolida* (type-species respectively of *Paramphibolia* and *Chaetogastrina*) differs slightly from that of typical *Amphibolia* species, and for this reason (taken in conjunction with the striking pattern difference) it is considered best to recognize two subgenera, distinguished by the same order of difference as that distinguishing the various subgenera here recognized in *Formosia* and *Rutilia*.

The main characteristics distinguishing *Amphibolia* s.l. from other Rutiline genera are as follows: suprasquamal ridge haired (distinction from *Formosia*, *Formodexia*, *Chetogaster*, *Rutilodexia* and *Prodiaphania*), postalar callus with three or four setae (distinction from *Chetogaster*), palpi normal and arista micropubescent (distinction from *Prodiaphania*); head entirely pollinose, non-metallic (distinction from *Chrysopasta*); facial carina contracted or evanescent ventrally (distinction from *Rutilia* s.l.); intermediate abdominal tergites (T<sub>3</sub> and T<sub>4</sub>) almost always with discal setae (distinction from all other genera except *Chetogaster*).

*Amphibolia* s.l. is most nearly allied to *Rutilia*, and the distinctions between these time-honoured genera are rather intangible. In general in *Rutilia* the facial carina is rather broad, often flattened on the fore surface, and not strikingly evanescent at its ventral end, whereas in *Amphibolia* the carina is conspicuously best developed on the upper part (which may be obviously bulbous) and weakly developed with the sides much convergent at the ventral end. Nearly always in *Amphibolia* there are a few erect discal setae present on tergites 3 and 4, but occasionally specimens lack abdominal discal setae on these tergites or one of the tergites may have only a single seta; on the other hand discal setae are apparently never present on the intermediate tergites in *Rutilia* (though doubtless some specimens of this genus will



ultimately be found that possess adventitious discals). But presence or absence of discals on T<sub>3</sub> and T<sub>4</sub> is a useful rule-of-thumb distinction between *Amphibolia* and *Rutilia*. Those *Rutilia* (a few species) which have the suprasquamal ridge bare are immediately separable from *Amphibolia* by this character (all known species of *Amphibolia* have the suprasquamal ridge fully haired). Likewise those *Rutilia* species that have a very broad medially depressed T<sub>5</sub> are at once separable from *Amphibolia*, which does not have a deep median depression in this tergite (the last tergite in all *Amphibolia* species is truncate subconical with scarcely any trace of flattening or hollowing medially at the tip).

The two subgenera of *Amphibolia* are distinguished by the following key:

#### KEY TO THE SUBGENERA OF *AMPHIBOLIA*

- 1 Thorax and abdomen with bold black-and-white pattern. Lobes of fifth sternite of ♂ simple. ♂ hypopygium with surstyli shorter than cerci (Text-figs 87-89). Apical pair of scutellar setae approximately as strong as other scutellar marginal setae . . . . . **AMPHIBOLIA** Macquart (p. 95)
- Thorax and abdomen without such pattern. Lobes of fifth sternite of ♂ with small tooth or prong on inner edge near apex (Text-figs 34 & 35). ♂ hypopygium with surstyli longer than cerci (Text-figs 85 & 86). Apical pair of scutellar setae much weaker than other marginal setae (sometimes absent)  
**PARAMPHIBOLIA** Brauer & Bergenstamm (p. 100)

#### Subgenus *AMPHIBOLIA* Macquart

*Amphibolia* Macquart, 1843 : 278 (121). Type-species: *Amphibolia valentina* Macquart, 1843 by original designation and monotypy.

**DIAGNOSIS.** Thorax black with bold discrete white-pollinose spots on dorsum. Calyptrae black or brownish black. Scutellum with apical pair of setae subequal in size to other marginal setae. Abdomen conspicuously patterned in contrasting black and white-pollinose areas. Thoracic and abdominal chaetotaxy not spiniform. Lobes of ♂ fifth sternite simple, without subapical tooth on inner edge. ♂ hypopygium with short broad surstyli (often slightly bifurcate) which are shorter than cerci.

**DISTRIBUTION.** Australia and Tasmania, Lord Howe Island, New Guinea.

**DISCUSSION.** This subgenus includes some of the most attractive and beautifully marked flies among the whole of the Rutiliini which are at once recognized by eye from their bold black-and-white coloration of the thorax and abdomen combined with their bright yellow heads. Not all species, however, which belong in the subgenus are quite so distinctive, for some have the white areas less boldly displayed than others, and not all of them have the yellow head colour. In general the species fall into two groups, one including the type-species (*valentina*) in which the head is mainly yellow or at most reddish brown and the abdomen has (as part of the pattern) discrete rounded black spots, and another including species in which the head ground colour is distinctly black and in which the abdomen (though possessing a pattern) lacks definite isolated black spots; these two groups, which are both Australian, are however interconnected by a new species (*papuanana*) here described from New Guinea, which has the black ground colour of the head but also has discrete

black abdominal spotting. As there is intergradation between the species it is not proposed to recognize formal species-groups.

The species of *Amphibolia* s. str. show some variability in the development of the chaetotaxy. In *A. ignorata* the bristling is especially weak and exceptionally short on the head and abdomen, and the head bristling is also very weak in *A. valentina* (in both these species the frontal setae are so short and fine that the rows are not cruciate and scarcely meet at the tips), but in *A. campbelli* all the setae are long and strong and the chaetotaxy of this species is almost identical with that of *A. stolidia* in the subgenus *Paramphibolia*. In *A. campbelli* (and also the closely similar *A. wilsoni*) the hairing as well as the chaetotaxy is more strongly developed than in other species, the parafacials being entirely haired (these are bare in all the species in which the head ground colour is either all bright yellow or all blackish). The pollinosity of the upper parafacials and lower parafrontals in *A. campbelli* has a shifting appearance according to the direction of the light which is unusual in Rutiliini, but recalls a rather similar condition found on the head of *Chrysopasta elegans*, and it is possible that the monotypic genus *Chrysopasta* has closer affinity with *Amphibolia* than with any other genus of Rutiliines.

An astonishing convergent resemblance exists between the black-and-white boldly patterned *Amphibolia* s.str. species and some other Calyptrate flies with similar patterning. In the subgenus *Euamphibolia* Townsend (q.v.), a segregate of *Formosia* s.l., and in the Ameniine Calliphorid genus *Formosiomima* Enderlein (see Crosskey, 1965), the thorax and abdomen has a black-and-white pattern formed in exactly the same way as in *Amphibolia*. In all of these flies the thoracic dorsum is black with thickly pollinose white marks in pairs on (1) the notopleural to humeral area, (2) the prescutum, (3) the supra-alar area, and (4) on the scutum submedially (these last sometimes evanescent), to which basic pattern there may be superimposed additional white-pollinose marks (usually in the form of one or two longitudinal vittae between the paired prescutal sublateral marks). The abdominal patterns are less constant throughout the range of species, though constant within a species, but the nature of the pattern is the same—being formed of areas of extensive thick overlay of white pollinosity contrasting with areas of black ground colour devoid of such pollinosity. In all three taxa of these apparent mimics, *Amphibolia*, *Euamphibolia* and *Formosiomima*, part of the abdomen appears black-spotted, each black spot in reality being an island (or a confluent pair of islands) not covered by the white-pollinose overlay. Some specimens of all three taxa also have a suggestion of greenish or violaceous tinge showing through the pale pollinose areas (an interference effect of the pollinosity overlying the blackish ground colour).

Paramonov (1968 : 357) states that *Amphibolia* species are parasitic on larval cockchafer. This is most probably correct, though Paramonov's evidence came only from a specimen of *A. valentina* in the CSIRO collection, Canberra, that was collected in Victoria and bears a label reading 'larvae of these flies parasitic on cockchafer grubs'.

#### INCLUDED SPECIES

*Amphibolia (Amphibolia) albocincta* (Malloch). AUSTRALIA (Australian

- Capital Territory, New South Wales). [Holotype examined].  
**A. (A.) campbelli** Paramonov. AUSTRALIA (Australian Capital Territory, New South Wales, Victoria). [Holotype examined].  
**A. (A.) comuni** Paramonov. AUSTRALIA (New South Wales, Victoria).  
**A. (A.) ignorata** Paramonov. AUSTRALIA (Western Australia to Victoria to Queensland); LORD HOWE ISLAND. [Holotype examined].  
**A. (A.) papuana** Crosskey **sp. n.** NEW GUINEA. [Described below].  
**A. (A.) valentina** Macquart. AUSTRALIA (Western Australia to Victoria to Queensland, Tasmania).  
*vidua* (Guérin-Méneville). [Syntypes lost].  
**A. (A.) wilsoni** Paramonov. AUSTRALIA (Victoria).

KEY TO SPECIES OF THE SUBGENUS *AMPHIBOLIA*

- |   |  |                                  |
|---|--|----------------------------------|
| 1 | Parafacials bare . . . . .   | 2                                |
| - | Parafacials completely haired . . . . .  | 6                                |
| 2 | Head yellow to orange-red with thick yellow to golden orange pollinosity. Hair of genae and postbuccae golden yellow . . . . .   | 3                                |
| - | Head black (at most slightly reddish on genae) with whitish or ashy grey pollinosity. Hair of genae and postbuccae black. [Only ♀♀ known] . . . . .  | 4                                |
| 3 | Last visible abdominal tergite (T <sub>5</sub> ) entirely black. Submedian pair of black spots on T <sub>3</sub> standing close together and normally coalesced before hind margin of the tergite. Pattern of abdominal T <sub>4</sub> consisting of two very large semi-circular black marks which meet and fuse in the mid-line (usually also a pair of very minute inconspicuous black dots in the white-pollinose area near the mid fore margin of the tergite). Vertex of ♂ 0·11-0·12 of head-width. Surstylus of ♂ genitalia as in Text-fig. 87 . . . . .  | <i>A. ignorata</i>               |
| - | Last visible abdominal tergite (T <sub>5</sub> ) with black-and-white pattern, sides of the tergite thickly white pollinose to a variable extent. Submedian pair of black spots on T <sub>3</sub> not meeting each other at hind margin of tergite, very clearly separated by white pollinose area which extends back in mid line to hind margin of tergite. Pattern of T <sub>4</sub> consisting of four large black spots standing against hind margin of tergite, an isolated lateral pair and an inner pair of rounded spots which fuse in the mid-line (occasional specimen may have lateral spot larger than usual and just meeting with the inner spot); T <sub>4</sub> in addition always with a pair of small but distinct submedian black dots near fore margin. Vertex of ♂ wider, 0·14-0·15 of head-width. Surstylus of ♂ genitalia as in Text-fig. 88 . . . . . | <i>A. valentina</i>              |
| 4 | Abdominal T <sub>3</sub> with a thick covering of whitish pollinosity and a black spot pattern consisting of a large transverse median spot and a pair of lateral spots standing on the hind margin of the tergite (in addition a very small black V-shaped area encroaching on white pollinose area anteriorly in the mid-line). [New Guinea]   | <i>A. papuana</i> sp. n. (p. 98) |
| - | Abdominal T <sub>3</sub> without a pattern of black spots, the black areas of the tergite in form of transverse bands. [Australia] . . . . .   | 5                                |
| 5 | Abdominal T <sub>3</sub> almost completely covered with thick white pollinosity (only very narrowly black against hind margin), abdomen therefore appearing to have a broad white fascia sub-basally . . . . .   | <i>A. albocincta</i>             |
| - | Abdominal T <sub>3</sub> mainly black, with only a narrow basal band of whitish pollinosity which is discontinuous at the mid-line . . . . .   | <i>A. comuni</i>                 |
| 6 | Vertex of ♂ 0·13-0·14 of head-width. Prescutum with a median whitish pollinose vitta which (seen in some lights) is more or less continuous to the transverse suture. Surstyli and cerci of ♂ genitalia as in Text-fig. 89 . . . . .   | <i>A. campbelli</i>              |



- Vertex of ♂ unusually narrow, about 0.09 of head-width. Median whitish vitta of the prescutum evanescent posteriorly, not reaching to suture . . . . . *A. wilsoni*  
 [This species is known only from the ♂ holotype. The genitalia have not been examined.]

*Amphibolia (Amphibolia) papuana* sp. n.

♀. *Head.* Ground colour mainly blackish, except for yellowish facial carina and reddish brown genal and postbuccal regions; parafrontals and interfrontal area black; head pollinosity white, thinner on parafrontals than elsewhere (in some lights lower end of parafrontal shows distinct line of demarcation where thicker pollinosity on parafacials and bottom end of parafrontal meets area of thinner pollinosity on parafrontal). Parafrontal and occipital hair black, genal and post buccal hair dark reddish brown. Frontal setae short and very fine, tips of opposite rows not meeting; one pair of divaricate ocellar setae; two pairs of well developed proclinate orbital setae. Vertex 0.24 of head width. Facial carina longer than epistome, narrow and nearly subfusiform but slightly widened at level with junction of second and third antennal segments and very slender on ventral third; facial profile moderately excavate between epistome and carina. Gena exceptionally broad, about 0.55 of eye-height. Parafacials very broad, about three and a half times wider than third antennal segment, entirely bare. Antennae slightly elongate, falling short of mouth-margin by about two-thirds of length of third segment; basal segments reddish with some black infuscation on inner edge of second segment, third segment blackish brown except for some bright orange colour at base; arista with short pubescence. Palpi tawny yellow. *Thorax.* Brownish black to black with bold white spots conspicuous to naked eye. Spots arranged as pair of large humeral-notopleural marks, pair of sublateral prescutal vittae (in which each vitta strongly contracted medially so that to naked eye the white vitta appears as separated spots), pair of slender median white vittae on prescutum between the sublateral vittae, pair of supra-alar spots on scutum and pair of submedian spots on scutum (these less boldly white than other spots); in addition prescutum with pair of very small spots standing against transverse suture just mesad of humeral-notopleural spots; mesopleuron and sternopleuron with large white spot; seen from in front prescutum shows trace of blue-green colouring under the anterior parts of the sublateral white vittae, and seen laterally scutum shows trace of coppery violaceous glints around supra-alar spots. All thoracic hair black. Chaetotaxy rather weak, three pairs of presutural acrostichal setae differentiated (standing on median white lines), two *postia* setae, 1 + 1 sternopleural setae, no setae developed on inner half of humeral callus (only two setae on outer half). Scutellum with very strong crossed apical setae, three or four pairs of other marginals, and with well developed preapicals. *Wings.* Basicosta dark. Wing membrane hyaline except for boldly marked basal dark spot in which cells completely blackened. Calyptrae blackish brown with dark brown marginal hair. *Legs.* Blackish brown with all black hair. Chaetotaxy weak, most setae short and fine; mid tibia with only one distinct *ad* seta; hind tibia with very short weak *ad* fringe and with two main *ad* setae and two *pd* setae. *Abdomen.* With black-and-white pattern. T1 + 2 and T5 entirely black. T3 with thick covering of whitish pollinosity over most of surface, except for very small median anterior V-shaped black mark and three black spots against hind margin; black spots arranged as lateral pair on extreme sides of abdomen and a broad median spot. T4 black with a transverse fascia of thick whitish pollinose covering on anterior quarter or third, the pale pollinose area extending back to occupy nearly half the tergite length mid dorsally and extending black medioventrally to reach the hind margin. Greenish tinge visible on pale pollinose areas of T4 dorsum, and venter distinctly green under the pale pollinosity; black areas of venter with violaceous tinge in some lights. Pale pollinose parts of T3 and T4 together giving abdomen appearance of having a broad transverse pale band contrasting with the black base and apex. Abdominal hairing black, mainly short, fine and semi-recumbent, but longer and erect on T5 and medially on T4. T3 with one pair of erect median marginal setae. T3 and T4 without discal setae, but holotype (only available specimen) has one large pore (seta itself missing) on the anteromedian V-shaped black mark of T3 near the fore margin

of the tergite. T<sub>5</sub> without trace of median depression, with a transverse row of strong erect discal setae standing near the centre of the tergite. *Measurements.* Body length 14.7 mm, wing length 12.6 mm [holotype only].

♂. Unknown.

#### MATERIAL EXAMINED

Holotype ♀, NEW GUINEA: Murrumbidgee Pass, 8600 ft, x.1961 (*W. W. Brandt*). In British Museum (Natural History), London.

**DISTRIBUTION.** Known only from the holotype from highland New Guinea.

**AFFINITIES.** This is the first species of *Amphibolia* to be discovered in New Guinea. Although only a single specimen is so far known it has been considered desirable to describe the new species because its provenance is unexpected and because it shows very distinctive features which make it intermediate between two groupings of *Amphibolia* s.str. species present in the mainland Australian fauna. Paramonov (1968 : 356) found that the Australian species fell into two moderately distinct groups, one with mainly yellow head and with black abdominal spots and the other with blackish head and no black abdominal spots, and he used this distinction for the first cut in his key to the Australian species. The new species *A. (A.) papuana* here described has the black head colour of the second of Paramonov's groups but has bold black abdominal spots on T<sub>3</sub> like the first group, and seems on this account to occupy a rather intermediate position; on total facies, however, it appears most closely allied to *A. (A.) albocincta* (Malloch), a species with dark head and no black spots from New South Wales. From a zoogeographical viewpoint this possibility is of interest because it provides another instance of a curious fact of Tachinid distribution that is becoming more and more evident—that there are elements in the Tachinid fauna of the New Guinea highlands that are quite disjunct from the rest of the Papuan fauna but are beyond doubt extremely closely allied to similar or almost identical forms in the mountainous parts of New South Wales (with, apparently, a very wide gap in distribution in Queensland).

The holotype of *papuana* sp. n. differs from typical *Amphibolia* specimens by seeming to lack definite discal setae on the intermediate abdominal tergites, but careful examination shows the presence of a large pore anteromedially on T<sub>3</sub>, confirming that abdominal discals can be present in this species. The probability is that specimens are variable in the development of discal setae in *papuana*, as in other species of *Amphibolia*, and it is to be expected that specimens obtained in future will not necessarily conform completely with the holotype in this detail of the abdominal chaetotaxy.

As a whole the strength and development of the chaetotaxy in *papuana* sp.n. is closely similar to that of *A. (A.) ignorata* Paramonov, in both species the abdominal and leg chaetotaxy in particular being very weak. It is of interest to note also the close resemblance in the distribution of the pale pollinose overlay of the abdomen in these two species; the abdominal pattern is essentially extremely similar in *papuana* and *ignorata*, differing only in that *ignorata* has a pair of minute median black spots in addition in the centre of the pale pollinose fascia of T<sub>4</sub>, and the median black spot of T<sub>3</sub> in *ignorata* is clearly composed of two partially fused spots. But *ignorata* has the head bright yellow and the antennae orange and on this feature alone is at once

separable from *papwana* (a specimen in the BMNH collection from Queensland standing under the name *ignorata* and having the bright yellow head has the abdominal pattern exactly as in *papwana*, and might perhaps belong to a different species: the specimen is of interest in showing that flies with an abdominal pattern that is an exact match with that of the New Guinea species occur in mainland Australia, even though quite different on other characteristics).

Subgenus **PARAMPHIBOLIA** Brauer & Bergenstamm **stat. n.**

*Paramphibolia* Brauer & Bergenstamm, 1891: 389 (85). Type-species: *Rutilia assimilis* Macquart, 1851, by monotypy.

*Chaetogastrina* Malloch, 1929: 313. Type-species: *Chaetogastrina stolidata* Malloch, 1929, by original designation. **Syn. n.**

**DIAGNOSIS.** Thorax without bold white pollen spots. Calyptrae semi-translucent yellowish or brownish. Scutellum with apical setae weak, much smaller than other marginal setae and sometimes not developed at all. Abdomen not patterned in contrasting black and white-pollinose areas. Abdominal chaetotaxy strong to slightly spiniform. Lobes of ♂ fifth sternite with distinct tooth or small sharp prong subapically on inner edge. ♂ hypopygium with surstyli as long as the cerci.

**DISTRIBUTION.** South-eastern Australia and Tasmania only.

**DISCUSSION.** This subgenus contains only two known species, *Amphibolia* (*Paramphibolia*) *assimilis* and *A. (P.) stolidata* (Malloch), which are the type-species of *Paramphibolia* and *Chaetogastrina* respectively. Malloch's description of *Chaetogastrina* consisted only of the sentence 'This genus is very similar to *Paramphibolia*, agreeing with it in structure of the head and thorax, but there are no parafacial hairs below level of bases of antennae', from which it is evident that Malloch's only criterion for generic separation lay in the bare or haired parafacials. There is no doubt that in the Rutiliini as a whole there are many very closely allied species which differ in the degree of hairiness of the parafacials, some species belonging obviously to the same distinctive group having them bare, others partially haired, and others completely haired. In the present work no subgeneric or generic significance is attached to bareness or hairiness of the parafacials, a character considered to be specific only (though a few subgeneric segregates may have the same condition in all or most of the included species). Since there are no other notable differences between *assimilis* and *stolidata* (though their superficial appearance is different because of different body and hair colouring and because of the different degree of development of the abdominal setae) these two species are here treated as unquestionably congeneric and consubgeneric; hence the name *Chaetogastrina* is placed as a new synonym of *Paramphibolia*.

The new synonymy of *Chaetogastrina* with *Paramphibolia* is supported by evidence from the fifth sternite and hypopygium of the male (which were not examined by Malloch). In both *stolidata* and *assimilis* each lobe of the fifth sternite is produced on the subapical part of the inner margin into a small tooth, a development that is found (to the best of my knowledge) nowhere else in the Rutiliini. In fact throughout most of the Proseninae the lobes of the male fifth sternite are simple rounded structures without any specialized developments. There is no doubt that the small



blunt sternite tooth in *stolida* (Text-fig. 34) and the rather more prominent, sharper, tooth in *assimilis* (Text-fig. 35) are homologous, and good indicators of a recent common ancestry for these two species. The hypopygium itself is also similar in the two species in the degree of development of the surstyli: although these are different in shape, and quite conspicuously so, they are large and long in both species and in profile their apices reach to a level with the apices of the cerci. In *Amphibolia* s.str. the fifth sternite lobes are simple and rounded as in other Rutiliini without trace of a tooth, and the surstyli are much shorter than the cerci; hence the genital structures provide the most positive morphological features for the differentiation of *Paramphibolia* (syn. *Chaetogastrina*) and *Amphibolia* s.str.

Paramonov (1954 : 275, 1968 : 367) assigned Malloch's *Chaetogastrina stolida* to the genus *Chetogaster* Macquart, and therefore sank the name *Chaetogastrina* into synonymy with *Chetogaster*, but he gave no arguments in support of this curious conclusion. There is a slight superficial resemblance between *stolida* and, for example, *Chetogaster oblonga* (Macquart), but otherwise there is almost nothing to suggest any close relationship between *stolida* and *Chetogaster*; *stolida* has supernumerary setae on the postalar callus, haired suprasquamal ridge, fully haired barettæ, and other features completely characteristic of the *Amphibolia-Rutilia-Chrysopasta* complex of genera, and it is here concluded that Paramonov's placement of *stolida* (and therefore of *Chaetogastrina*) is much in error. Malloch (1929) was undoubtedly right to emphasize the close resemblance between *stolida* and *Paramphibolia*.

The bristling of the abdomen in *A. (P.) assimilis* is so characteristic that this species can be distinguished at a glance on this feature from all other Rutiliini; the setae are unusually thickened and abundant, there being a transverse row of many erect setae across the whole hind margin of T<sub>3</sub>, and exceptional strong development of slightly spiniform discal setae on T<sub>3</sub> and T<sub>4</sub> (these varying in number and arrangement but at least two always being present and very obvious on each tergite). Sometimes the strong discals of one or both intermediate tergites form a large cluster or an irregular transverse row.

Specimens of both *assimilis* and *stolida* are rare in collections, but on available evidence the two species appear to be allopatric: *assimilis* is found in Tasmania and Victoria, and *stolida* in the mountainous parts of New South Wales. Nothing is known of the host-relations.

INCLUDED SPECIES

*Amphibolia (Paramphibolia) assimilis* (Macquart) **comb. n.** AUSTRALIA (Tasmania, Victoria). [Lectotype examined].

*A. (P.) stolida* (Malloch) **comb. n.** AUSTRALIA (New South Wales). [Holotype examined].

KEY TO SPECIES OF THE SUBGENUS *PARAMPHIBOLIA*

- 1 Parafacials haired. Pleural regions of thorax with yellowish white to golden yellow hair (some dark hair on mid-mesopleuron). Abdomen mainly pale tawny brown (♂) to red-brown (♀) with distinct median black vitta. Abdominal chaetotaxy mainly strongly spiniform. Surstyli of ♂ genitalia as in Text-fig. 85. [Tasmania & Victoria] . . . . . *A. assimilis*

- Parafacials bare. Pleural regions of thorax with black hair. Abdomen very dark brownish black with indistinct median vitta. Abdominal chaetotaxy not unusually spiniform. Surstyli of ♂ genitalia as in Text-fig. 86. [New South Wales] . . . . . *A. stolidus*

### Genus *CHRYSOPASTA* Brauer & Bergenstamm

*Chrysopasta* Brauer & Bergenstamm, 1889 : 152. Type-species: *Chrysopasta versicolor* Brauer & Bergenstamm, 1889 [= *Rutilia elegans* Macquart, 1846], by original designation and monotypy.

*Roederia* Brauer & Bergenstamm, 1893 : 98. Type-species: *Chrysopasta versicolor* Brauer & Bergenstamm, 1889 [= *Rutilia elegans* Macquart, 1846], by monotypy (see text for explanation). [Junior homonym preoccupied by *Roederia* Mik, 1881].

*Echrysopasta* Townsend, 1932 : 39. Type-species: *Rutilia elegans* Macquart, 1846, by original designation.

*Euchrysopasta*: Paramonov, 1968 : 372-373. Incorrect subsequent spelling of *Echrysopasta* Townsend, without status in nomenclature.

DIAGNOSIS. Facial carina with prominent bulbous upper part contracting ventrally to a sharp narrow ridge. Epistome very strongly prominent, subnasute, face in profile deeply concave between epistome and carina. Head of ♂ not holoptic and upper eye facets not enlarged, frons much wider than facial carina. Parafacials densely long haired, hairing virtually continuous with that of genae. Buccal opening normal, much wider than facial carina in both sexes. Genal dilation strongly developed, extending forwards to or just beyond level of front of eye. Head pollinose anteriorly and on postorbits (pollinosity of lower parafrontals and postorbits with shifting chequered appearance), metallic on occipital and postbuccal regions. Arista micropubescent. Palpi medium size, much shorter than the unusually slender proboscis. Proboscis with slender mentum tapering slightly in profile towards labellae. Prosternum and prosternal membrane bare or haired (prosternum even strongly setose in some specimens). Scutellum with apical pair of setae inserted at lower level than other marginal setae; total of 4-5 pairs of marginals; disc of scutellum convex. Postalal callus with three setae. Postalal wall bare. Suprasquamal ridge haired. Upper calypter normal. Tegula with normal long wiry posterior setulae. Costal base not explanate. Abdomen with marginal vestiture of tergite venters hairy only and semi-recumbent, no development of strong setae; T<sub>3</sub> without median marginal setae in ♂ or at most with one pair, with one or two pairs in ♀; intermediate tergites without discal setae (rarely T<sub>3</sub> or T<sub>4</sub> with one small stubby adventitious setula); T<sub>5</sub> truncate subconical without median depression, hypopygium of ♂ strongly prominent, surstyli as in Text-figs 91-94.

DISTRIBUTION. Western Australia only.

DISCUSSION. At present this genus is monotypic, containing only *Chrysopasta elegans* (Macquart). It is possible, however, that this species as now understood might be a species complex (see later discussion). Townsend (1932, 1938) considered that *elegans* is generically distinct from *versicolor* Brauer & Bergenstamm (the type-species of *Chrysopasta*) and proposed the genus *Echrysopasta* for *elegans*, but I agree with Paramonov (1968 : 373) that *elegans* and *versicolor* are congeneric (though specific synonymy is less certain) and therefore that *Echrysopasta* is a synonym of *Chrysopasta*. (Paramonov cited Townsend's name as *Euchrysopasta*, an incorrect subsequent spelling.) Comparison of the types (in British Museum (Natural History)) of *zabirna* Walker and *elegans* Macquart supports the synonymy of the former with the latter originally indicated by Malloch (1930 : 106) and recently

repeated by Paramonov (1968 : 372), although there are some slight differences in the ♂ genitalia.

The only other generic name involved in the synonymy of *Chrysopasta* is *Roederia* Brauer & Bergenstamm, which Townsend (1938 : 412) cited as an isogenotypic synonym of *Chrysopasta* with the type-species fixed by monotypy. When Brauer & Bergenstamm (1889 : 152) first described the genus *Chrysopasta* with its single species *versicolor* they placed the genus on its own in a family Röderiidae ('Gruppe XLIX' in their classification), without at that time describing a type-genus *Roederia* under this name; in their next work Brauer & Bergenstamm (1891 : 418) again listed *Chrysopasta versicolor* in 'XLIX. Gruppe Röderiidae' but still without a generic name *Roederia*. However in the next following part of their work Brauer & Bergenstamm (1893 : 98) published the name *Roederia* in a key to genera and *Röderia* in the generic index (*op. cit.* : 237), referring in the latter to the pages in their 1889 and 1891 works on which their Gruppe Röderiidae, containing only *Chrysopasta*, appeared. The name *Chrysopasta* does not appear in the generic key in the 1893 work, but this genus runs down to and conforms exactly with *Roederia*, and this fact together with the cross-references given in the 1893 index linking *Roederia* to Gruppe Röderiidae (and therefore to *Chrysopasta*, the only contained genus) leaves no doubt that *Roederia* Brauer & Bergenstamm and *Chrysopasta* are one and the same genus. I therefore agree with Townsend that *Roederia* is a synonym of *Chrysopasta* and that *versicolor* is its type-species by monotypy. A possible explanation for the confusion over the names is that Brauer & Bergenstamm, after deciding upon the name *Roederia* for this Rutiliine, realized that the name was preoccupied by *Roederia* Mik, 1881, and changed to *Chrysopasta*—but that the name *Roederia* got published in the 1893 work by an oversight instead of *Chrysopasta* in the generic key. No replacement name is, of course, required for *Roederia* Brauer & Bergenstamm because of its junior objective synonymy with *Chrysopasta*. Paramonov (1968) omitted *Roederia* completely from his treatment of *Chrysopasta*, without explanation.

Paramonov (1968 : 372) implied that *Chrysopasta* is so different from other Rutiliini when considered alongside some undescribed species known to him that it might be necessary later to refer the genus to some other tribe. Though these undescribed forms to which he referred are not known to me it does not seem probable on the basis of *elegans* that *Chrysopasta* could justifiably be excluded from the Rutiliines. It possesses so many of the uniquely or at least typically Rutiliine characteristics that it seems to me to be unquestionably a member of this tribe: for example it shows in combination such features as more than two postalar setae, thickly hairy suprasquamal ridge, frequently hairy prosternum and prosternal membrane, hairy barete, and completely Rutiliine body facies, which together would hardly permit it to be included in any other tribe (as least so far as the tribes of Prosenine Tachinidae are envisaged at present).

Within the Rutiliini the genus seems to be most nearly allied to *Amphibolia*, more especially to the subgenus *Paramphibolia*, with which *Chrysopasta* possesses in general more common features than with the other genera. There is much similarity in shape of the facial carina, the hairy suprasquamal ridge, the frequently strongly



haired prosternal regions, the head facies, and abdominal form, but *Chrysopasta* differs from *Amphibolia* s.l. by having the back of the head metallic, stronger and more extensive vestiture on the facial ridges, by the rather more slender mentum and smaller palpi, and by the weaker abdominal chaetotaxy (in which discal setae are absent on T<sub>3</sub> and T<sub>4</sub> except for the occasional occurrence of a small isolated adventitious setula).

The head in *Chrysopasta* shows some unusual features not found in quite the same form in other Rutiliini. The epistome reaches its most strongly nasute development among the whole tribe, being extremely prominent in profile and set off from the facial carina by a very deep concavity (Text-fig. 6), and the facial ridges are more strongly and extensively haired above the vibrissae than in other genera; the setae of the frontal rows also descend further down on to the extreme upper ends of the parafacials than in other genera, so that in profile there is a smaller gap than usual between the uppermost setulae on the facial ridges and the lowermost frontals. The parafacial hairing is more strongly developed than is normal and extends to a level below the bottom of the eye (the hairing virtually merging with the hairing of the genae); in other Rutiliini the parafacials, when haired, have the hairing only extending about to the bottom of the eye at most and there is a definite bare gap between genal and parafacial hairing. The postorbits in *Chrysopasta* are most characteristic, having silvery-white pollinose spots alternating with black (almost non-pollinose) spots, this being very obvious to the naked eye and having no counterpart elsewhere in the Rutiliines; somewhat similar pollinose areas having a shifting chequered appearance are present on the lower ends of the parafrontals.

In many specimens the mesonotal chaetotaxy is very strong. The humeral callus rather characteristically has only three setae set in a shallow triangle with the innermost seta unusually strong, but there is sometimes a weakly developed fourth seta laterad of the innermost strong one, so that the humeral chaetotaxy is basically the same as in other Rutiliini. When several specimens are examined the chaetotaxy is found to be much more variable than Paramonov's (1968 : 373) description indicates: one very strong *ph* (Paramonov's 'sublateral') is normal, but a second may be present;  $2 + 2$  *acr* is common, but there may be more presutural acrostichals than two; the *post dc* are usually four (length and strength very variable); often three or even four supra-alars; though usually only one strong *post ia* seta is present the female often has two very strong *post ia*. The sternopleurals are variably  $1(2) + 1$  as Paramonov states. The legs of *Chrysopasta* are more strongly bristled than usual in Rutiliini and the claws and pulvilli are exceedingly large, especially in the male in which they are strikingly obvious to the naked eye; the hind tibia has a long antero-dorsal fringe but this does not form a regular close-set comb as in many Rutiliines, being composed instead of some fine rather hairlike setulae interposed between longer and stronger ones so that the fringe is irregular and loose (not comb-like); the *pv* apical seta of the hind tibia is much longer and stronger than usual.

The mesonotum has a bold pattern that is a little different from any other Rutiliine. The prescutum and scutum are pale silvery bluish and have four broad bold sooty black vittae that are discontinuous at the suture so that the scutum appears to have a transverse row of four elongate spots of black (of which the inner pair are

shorter and more quadrate than the outer pair). The abdomen is metallic greenish or bluish in ground colour except for the hind margins of the tergites which are brownish black, and the paler bases of T<sub>3</sub>-T<sub>5</sub> have an overlay of silvery or yellowish white pollinosity which gives the abdomen a transversely banded appearance.

Paramonov (1968) drew attention to the great variability of *Chrysopasta elegans*, and presuming that all the specimens so far available are truly conspecific then *elegans* is the most variable species in the Rutiliini. Paramonov did not mention the male genitalia, but these too differ greatly in different specimens (Text-figs 91-94). This casts considerable doubt on whether *elegans* and its supposed synonyms (*zabirna* and *versicolor*) are really one species, and suggests the possibility that a species-complex is involved. In general it does not seem likely that several distinct species occur within the relatively circumscribed area of south-west Western Australia (where *Chrysopasta* is apparently confined) yet, on the other hand, it would be very exceptional for a single species of Rutiliini (or any Tachinid) to manifest the diversity in the male genitalia that is to be found amongst specimens of *Chrysopasta*. The diversity in the male genitalia affects not only the size and shape of the cerci and surstyli, but also the size of the epandrium (which in some specimens is much bigger in relation to the cerci and surstyli than in other specimens). The Text-figs 91-94 exemplify the diversity amongst different male specimens: Text-fig. 91 shows an enlarged epandrium, very sharply pointed surstylus and very long tapering cerci found in a specimen from Newdegate, W.A.; Text-fig. 92 shows very broad foliaceous surstyli and unusually small cerci found in a specimen from 6 miles north of Watheroo, W.A.; Text-fig. 93 shows the shape of the surstyli and cerci in the holotype of *elegans* (exact locality unknown); and Text-fig. 94 shows the shape of the surstyli and cerci in the lectotype and paralectotype of *zabirna* from Perth, W.A.

Differences in male genital form of this order in other Rutiliini would normally imply distinct species and would normally be correlated with some constant, if minor, external differences. In the case of *Chrysopasta*, however, there is not at present nearly sufficient material available to determine whether the four distinct forms of male genitalia so far detected are discrete entities or whether they represent points along a range of variability (for example, when enough material is to hand it might prove that there is every gradation in surstylus shape from the sharp-pointed form of Text-fig. 91 to the broad rounded form of Text-fig. 92). The male genitalia do not, on the basis of present knowledge, provide adequate evidence as to whether *elegans* is one highly variable species or a complex of species; it therefore appears best to retain the names *zabirna* and *versicolor* in synonymy with *elegans*, and to consider all available material as conspecific, until more evidence can be adduced.

Variability exists in many external characteristics as well as in male genitalia. It is possible that some of the external differences may be found to correlate with the genital differences when sufficient material is studied, but no convincing correlation has so far been discovered. Most of the variable external features show a fairly complete gradation, e.g. the legs range from all reddish yellow to all brownish black and the prosternum and prosternal membrane show all conditions from bare to very strongly haired (or even bristled). Some specimens have mainly yellow pleural

hair and others black pleural hair (sometimes with pale hair on barettæ or pteropleuron), and the number of median marginal setae on abdominal T<sub>3</sub> varies in different specimens (there is also sexual dimorphism in these setae which are often absent in males but always present in females). The strength of the parafacial hairing varies greatly amongst females.

It may be useful to note the condition of some of these varying features in the primary types of *elegans* and *zabirna* in case it is later concluded that *elegans* is an admixture of species. In the holotype of *elegans* the legs are blackish brown with slightly more reddish tibiae, the pleural hair is black except for some golden hair on the lower pteropleuron and the barettæ, and the prosternum and prosternal membrane are strongly haired (the prosternum even bears one very long strong downwardly directed bristle on each side); in the lectotype of *zabirna* the legs are similar to *elegans* type, the pleural hair is also black but there are only a few pale hairs on the pteropleuron and all the barettæ hair is black, and the prosternum and prosternal membrane have a few strong hairs (but no definite bristle). The paralectotype specimen of *zabirna* is topotypic and unquestionably conspecific with the lectotype, but has the prosternum and prosternal membrane almost completely bare (one long recumbent hair on one side of the membrane, no hair at all on the prosternum itself); otherwise it agrees with the lectotype. (Townsend, 1932 : 39, noted the two strong prosternal setae in the holotype of *elegans*, as '2 PST', but his statement that the rest of the prosternum is bare is incorrect.) In the primary types of both *elegans* and *zabirna* the prosternal hair is black. The lectotype of *versicolor* could not be located for study during the present work.

The specimen from Newdegate with male genitalia as in Text-fig. 91 has mainly yellow pleural hairing (only mesopleural hair mainly black), has some long fine very pale yellowish hair on the prosternum, and has the legs entirely reddish yellow; the specimen from near Watheroo with male genitalia as in Text-fig. 92 has the pleural hair similar to that of the Newdegate specimen, but has the prosternum and prosternal membrane completely bare, and has the coxae and femora partly blackish-brown with the rest of the legs reddish.

Macquart (1846) recorded the provenance of *elegans*, at the time of description, as 'île Sydney' (New South Wales), and the holotype from Bigot's collection bears a label by Austen recording the locality as Sydney, New South Wales; the same type-locality was indicated in my paper on Macquart's Australian Tachinid types (Crosskey, 1971). It is now certain, however, beyond any real doubt that the type must have come from Western Australia: all later known material is from Western Australia, and it is here considered that Paramonov (1968 : 374) was right to regard Macquart's stated provenance as a mistake and to accept Western Australia as being the true type-locality.

Almost nothing is known of the early stages and host-relations of *Chrysopasta*. Malloch (1930 : 106) described the puparium from a specimen with its associated adult from Swan River, and stated that another specimen from this locality had a label reading '*Rutilia* sp. in nest of Termites, *Eut. westaustraliensis*'. It is extremely improbable that *Chrysopasta* has a termite host as the known hosts of Rutiliini are all coleopterous, and it should be assumed that there is no direct connection in the



life-history between *Chrysopasta* and termites: Townsend (1936 : 152), referring to Malloch's note, wrote that '*Echrysopasta* has been reared in West Australia from a puparium found in nest of *Eutermes*, but it is likely that the maggot was a white grub parasite whose host in the soil had accidentally become incorporated into the termite nest'. This is a reasonable supposition, and the reference to a possible inquiline relationship between *Chrysopasta* and termites made by Colless & McAlpine (1970) on page 737 of *The Insects of Australia* must be treated with caution.

#### INCLUDED SPECIES

- Chrysopasta elegans* (Macquart). AUSTRALIA (Western Australia). [Holotype examined].  
*versicolor* Brauer & Bergenstamm.  
*zabirna* (Walker). [Lectotype examined].

#### Genus *PRODIAPHANIA* Townsend

*Diaphania* Macquart, 1843 : 277 (120). Type-species: *Diaphania testacea* Macquart, 1843, by monotypy. [Junior homonym preoccupied by *Diaphania* Hübner, 1818 (Lepidoptera).] *Prodiaphania* Townsend, 1927 : 159. Replacement name for *Diaphania* Macquart, 1843, preoccupied by *Diaphania* Hübner. Type-species: *Diaphania testacea* Macquart, 1843, by automatic fixation.  
 [Senostoma sensu authors, not Macquart. Misidentification.]

DIAGNOSIS. Facial carina broad and flattened, sides subparallel or only slightly convergent below, widely separating antennal bases. Epistome strongly prominent, subnasute, face in profile deeply excavate between epistome and carina. Head of ♂ not holoptic but frons strongly narrowed, not wider than facial carina, upper eye facets not enlarged. Parafacials haired on upper parts. Buccal opening elongate and strongly narrowed medially, at narrowest point subequal in width to or even a little narrower than facial carina. Genal dilation well developed. Head pollinose, non-metallic. Arista bushy plumose or long-pubescent. Palpi exceptionally small, sometimes papilliform, shorter than third antennal segment. Proboscis with mentum parallel-sided or at most only a little tapering in profile. Prosternum and prosternal membrane bare. Scutellum with apical pair of setae inserted conspicuously lower than other marginal setae; total of four to nine pairs of scutellar marginals; disc of scutellum convex. Postalar callus with four to six strong setae (three in holotype of *cygnus*). Postalar wall bare. Supra-squamal ridge bare. Upper calypter extraordinarily developed, subequal in length in both sexes to lower calypter. Tegula with normal long wiry posterior setulae. Costal base very strongly explanate (wings in resting position appearing to have prominent 'shoulders'). Abdominal venter without strongly developed setae on tergites; T<sub>3</sub> dorsally without median marginal setae or at most with one pair in ♀, marginals of T<sub>4</sub> short; no abdominal discal setae. T<sub>5</sub> truncate subconical, without median depression (at most with only slight flattening or hollowing at extreme tip).

DISTRIBUTION. Australia only; occurring from Western Australia to Victoria and north to Queensland, present in Tasmania.

DISCUSSION. There has been some confusion in the nomenclature of this distinctive genus, to which it is necessary to refer before considering the characteristics and affinities. Macquart's name *Diaphania* is preoccupied by Hübner's use of this name in Lepidoptera, but Brauer & Bergenstamm (1889 : 126; 1893 : 175) and Engel (1925 : 343)—being evidently unaware of the homonymy—continued to use *Diaphania* Macquart as a valid name; later, however, Townsend (1927 : 159)

realised the homonymy and published the replacement name *Prodiaphania*, which remains the valid name for this genus, and was used in publication by Malloch (1928b : 615; 1929 : 291) and Paramonov (1968 : 355, 384). Unfortunately, the name *Senostoma* Macquart has been misapplied to the genus, notably by Malloch (1936 : 10-15) and Townsend (1938 : 426), as the result of misidentification and erroneous synonymy of its type-species. *Senostoma* was described as a monotypic genus with *S. variegata* Macquart as its type-species, and Macquart's female holotype of *variegata* from the Bigot collection is in the British Museum (Natural History) (Crosskey, 1971 : 291); examination of this holotype shows that *variegata* (and therefore *Senostoma*) does not belong in the Rutiliini at all, but in the Prosenini near *Rhynchioidexia* Bigot (of which *Senostoma* may well be a senior synonym). Engel however found a female specimen in the collection of the Vienna Museum that belonged to the species *Diaphania testacea* Macquart (type-species of *Diaphania* = *Prodiaphania*) and bore a label erroneously purporting that it was Macquart's type of *variegata*, and Engel (1925 : 344) therefore synonymised *variegata* with *testacea*; Townsend (1932 : 40) saw the same specimen in Vienna and also considered that this synonymy was correct, recording it again later in his *Manual of Myiology* (Townsend, 1938 : 426). It seems certain that neither Engel nor Townsend troubled to compare the Vienna specimen with Macquart's (1847 : 96) original description of *Senostoma variegata*, from which it is obvious that it was not based on a Rutiliine specimen and that Macquart's figure (plate 5, fig. 3) scarcely resembles a *Prodiaphania* species. Their mis-recognition of the type led Townsend (1938) to supplant his name *Prodiaphania* with *Senostoma*, which would be nomenclaturally correct if the synonymy of *variegata* and *testacea* was correct; as it is not, and as *Senostoma* as correctly interpreted is not a Rutiliine, the name *Prodiaphania* Townsend stands valid for the present genus.

*Prodiaphania* is the most distinctive and easily recognized genus in the Rutiliini, and because of the external homogeneity of the species in conjunction with the presence of some unusual features can be more satisfactorily defined than the other genera. The palpi are minute (as Macquart noted in the original description of *Diaphania*) and this character alone separates *Prodiaphania* from all other genera, but other distinctive characters include the great enlargement of the upper calypter (which in the wings-closed position is as long as or nearly as long as the lower calypter), the unusual elongation of the head in the epistomal axis (Text-fig. 7) with consequent elongation of the buccal opening (Text-fig. 15), the conspicuously plumose or unusually long-pubescent arista on which the hairing is strikingly bushy, and the exceptionally explanate costal base (Text-fig. 26) giving the impression of basal 'shoulders' to the wings. Taken together these characters give *Prodiaphania* a very characteristic facies and set the genus rather apart from other genera; it is not possible to ascribe particularly close affinity to any other genus, but there is some notable resemblance in certain features such as the elongate buccal opening and explanate costal base to *Formodexia* gen. n. (but the very elongate palpi, normal upper calypter and haired postalar wall immediately distinguish *Formodexia* from *Prodiaphania*). The suprasquamal ridge is bare in *Prodiaphania* and this at once distinguishes the genus from *Chrysopasta*, *Amphibolia* and nearly all *Rutilia*, but the

reduced palpi and enlarged upper calypter already referred to also provide obvious differential characters from these genera.

The feature of enlarged upper calypter is most noteworthy, as enlargement of the *upper* calypter seems to occur nowhere else in the Tachinidae. Several unrelated Tachinids have the *lower* calypter enlarged, even to such an enormous extent in the male that the whole abdomen is covered by them, but the lower calypter is never enlarged in Rutiliini whereas the upper one is in *Prodiaphania*.

The species of *Prodiaphania* are extraordinarily uniform in their externals, although there are some minor differences in the leg chaetotaxy which can be used to differentiate certain species or groups of species in a key. But, luckily for the taxonomist, the male genitalia in *Prodiaphania* are more diverse and provide more uniquely distinctive characters for distinguishing species than in any other genus of Rutiliini, and both Malloch (1936) and Paramonov (1968) have made use of (and figured) the male genitalia of several species. Some of the developments in the genitalia of male *Prodiaphania* are rather bizarre (by the standards of Tachinidae) and include the enlargement of the surstyli into enormous flattened elliptical plates set in the transverse plane (in *georgei*), the development of a very large forwardly projecting process at the base of the surstylus (as in *furcata*) and the development of exceptionally dense tufts of long hair on the bases of the surstyli (as in *testacea*). Sometimes the male genital characters are very distinctive even when the external features show no evident reliable differences, and consequently dependable keys to the species need to be based mainly on the male genitalia. Females rarely show any reliable differences and it is difficult or well-nigh impossible to associate wild caught females with males.

Paramonov (1968) published a key to females as well as to males, and even described one species (*walkeri*) from a unique female holotype, but it seems to me that some of Paramonov's associations of females with males are very uncertain and in my view it is impossible at present to identify females reliably and therefore impossible to provide a workable key to them. Even Paramonov's key, on assumed associations of identity, seems very unsatisfactory, and *walkeri* (based only on the female) conflicts in the key characters with those cited in the description: in *walkeri* description (p. 400) the palpi are 'about as long as the third antennal segment' and the 'calypters of about same size', whereas the species is run out in the key (p. 387) by the couplets reading 'Upper calypter distinctly shorter than lower' and 'Palpi half as long as third antennal segment'.

In the present work it has been concluded that Paramonov's keys to *Prodiaphania* are not very satisfactory, and that only a key to males is practicable at this stage. I have therefore attempted to give here a revised key to males, based upon male genitalia together with the few external features that seem reliable, and have given figures of the male genitalia for as many species as I can (not all the types have been to hand during this work). Before giving this key, and the list of included species, it is necessary to allude to some of the nominal species which Paramonov (1968) included in *Prodiaphania*.

Paramonov (1968 : 391) assumed that *ruficornis* Macquart belonged in the genus, but this is incorrect; the male holotype of *ruficornis* has been examined and found to



belong to *Rutilia* (*Microrutilia*), in which subgenus the name is a synonym of *media* Macquart (see p. 90); Malloch was therefore right to place *ruficornis* in *Rutilia* and Paramonov wrong to place it in *Prodiaphania*. Regarding *vittata* Macquart, Brauer (1899 : 513) was right to place it in *Senostoma* auct. (= *Prodiaphania*), and Paramonov's (1968 : 401) supposition that 'Probably it [*vittata*] is a species of *Rutilia* or *Chetogaster*' is wrong; the female holotype (in London, not Paris as Paramonov thought) has been examined and found to be a *Prodiaphania* (almost certainly the female of *testacea* Macquart). Another incorrect supposition of Paramonov (1968 : 402) is that *echinomides* Bigot is probably not a *Prodiaphania*; Brauer (1899 : 512) placed this nominal species, under the misspelling *echinomyidea*, in *Diaphania* (= *Prodiaphania*) and examination of the female holotype during the present work has shown this to be correct (though the evidence that *echinomides* is a synonym of *testacea* as Malloch (1928c : 657) stated is not good: it appears unlikely that the specific synonymy is correct and it is here not accepted).

The early stages and host relations of *Prodiaphania* are still completely unknown.

#### INCLUDED SPECIES

- Prodiaphania arida* Paramonov. AUSTRALIA (Victoria). [♂ paratype, data as holotype, examined].
- P. biarmata* (Malloch). AUSTRALIA (South Australia). [Holotype examined].
- P. brevitarsis* Paramonov. AUSTRALIA (New South Wales).
- P. claripennis* Malloch. AUSTRALIA (Western Australia). [Holotype examined].
- P. commoni* Paramonov. AUSTRALIA (South Australia, Victoria).
- P. cygnus* (Malloch). AUSTRALIA (Western Australia). [Holotype examined].
- P. deserta* Paramonov. AUSTRALIA (New South Wales, Queensland). [♂ paratype, data as holotype, examined].
- P. echinomides* (Bigot). AUSTRALIA (? state). [Holotype examined].
- P. fullerae* Paramonov. AUSTRALIA (New South Wales).
- P. funebris* Paramonov. AUSTRALIA (South Australia, Western Australia).
- P. furcata* (Malloch). AUSTRALIA (A.C.T., New South Wales, South Australia, Victoria). [Holotype examined].
- P. genitalis* Paramonov. AUSTRALIA (A.C.T., New South Wales, Queensland, Victoria). [Holotype examined].
- paratestacea* Paramonov **syn. n.** [♂ paratype, data as holotype, examined].
- P. georgei* Malloch. AUSTRALIA (New South Wales, South Australia, Western Australia). [Holotype examined].
- P. minuta* Paramonov. AUSTRALIA (Queensland). [♂ paratype, data as holotype, examined].
- P. regina* (Malloch). AUSTRALIA (Queensland). [Holotype examined].
- P. testacea* (Macquart). AUSTRALIA (Tasmania to Queensland).
- P. victoriae* (Malloch). AUSTRALIA (Victoria to Queensland). [Holotype examined].
- P. vittata* (Macquart). AUSTRALIA (South Australia). [Holotype examined: probably ♀ of *testacea*].
- P. walkeri* Paramonov. AUSTRALIA (Western Australia).

KEY TO SPECIES OF THE GENUS *PRODIAPHANIA*

[*Note*: The following key is to males only. Females usually cannot be reliably associated with males, and it is considered that dependable keys to females cannot be given in the present state of knowledge; the three nominal species *echinomides*, *vittata* and *walkeri* cannot be included in the key as they have female holotypes which have not yet been associated with known males. *P. claripennis* is omitted as its male holotype has not been seen, and insufficient data is to hand for reliable inclusion.]

- 1 Sternites concealed, ventral ends of tergites meeting each other in mid ventral line of abdomen so that sternites are completely covered. Hind tibia without *pd* setae. Hind femur with some *pv* setae basally or submedially ♂ genitalia with large foliaceous surstyli orientated in the transverse plane (Text-figs 101, 106) 2
- Sternites exposed partially or completely, ventral ends of tergites separated from each other in mid venter of abdomen Hind tibia with one or more *pd* setae (very rarely none). Hind femur with or without *pv* setae. ♂ genitalia with surstyli not of this form . . . . . 4
- 2 Hind tibia with a secondary fringe of semi-erect setulae on the *a* surface in addition to the main *ad* fringe. [♂ genitalia not seen] . . . . . ***P. commoni***  
[No material has been seen of this species, which is only doubtfully distinct from *biarmata*]
- Hind tibia without a distinct secondary *a* fringe in addition to the main *ad* fringe (hairing of *a* surface all small, weak and virtually recumbent). ♂ surstyli and cerci as Text-fig. 101 or 106 . . . . . 3
- 3 ♂ genitalia with surstyli enormous in relation to epandrium and surstyli and cerci exceedingly slender in profile (Text-fig. 101). [Western Australia] ***P. georgei***
- ♂ genitalia with surstyli not exceptionally enlarged in relation to epandrium and surstyli and cerci much broader in profile (cerci broad basally and with very strong apical curvature) (Text-fig. 106). [South Australia] . . . . . ***P. biarmata***
- 4 Hind femur without any *pv* setae. Hind femur with *av* setae confined to apical third or half . . . . . 5
- Hind femur with some *pv* setae basally or medially (very few and rather weak in *victoriae*). Hind femur with *av* setae and long strong hairs irregularly along its whole length (except in *victoriae*, in which *av* setae confined to apical half) . . . . . 13
- 5 Surstylus of ♂ genitalia with a long forwardly directed basal process that is nearly as long as the main part of the surstylus or at least half as long (Text-figs 95, 96, 105) 6
- Surstylus of ♂ genitalia not of this form, if with a forwardly directed basal process this in the form of a short bluntly rounded lobe (Text-figs 97-100, 103, 104) . . . . . 7
- 6 Basal process of surstylus rounded apically and bearing a very long dense black hair tuft (Text-fig. 95) . . . . . ***P. testacea***
- Basal process of surstylus slightly bifurcate and pointed apically and with very short inconspicuous hairing (Text-figs 96 & 105) . . . . . ***P. furcata***
- 7 Surstylus of ♂ genitalia in profile strongly curved, very long and narrow, with sparse hairing confined to the basal part (e.g. Text-fig. 100) . . . . . 8
- Surstylus of ♂ genitalia in profile moderately broad and only at most slightly curved, usually (not *funnebris*) with rather long dense hairing on most of its length (Text-figs 97-99, 103, 104) . . . . . 9
- 8 Surstylus of ♂ genitalia extremely slender and of even width along its length (fig. 2C in Paramonov, 1968 : 388) . . . . . ***P. brevitarsis***
- Surstylus of ♂ genitalia slightly but distinctly clavate, narrower near the base than on apical half (Text-fig. 100) . . . . . ***P. genitalis***
- 9 Surstylus of ♂ genitalia as in Text-fig. 103, hairing mainly confined to basal third and consisting mostly of a moderately dense bunch of long strong hairs arising from a swollen rounded anterobasal prominence on the surstylus. Setulae of *ad* fringe

- of hind metatarsus very long and conspicuous. Hind tibia with a secondary fringe of irregular semi-erect setulae along the *a* surface in addition to the normal *ad* fringe . . . . . *P. funebris*
- Surstyli of ♂ genitalia not as in Text-fig. 103, outer surface extensively hairy and only the tip bare, no definite anterobasal swelling. Setulae of *ad* fringe of metatarsus weak and inconspicuous or longer than metatarsal diameter. Hind tibia with or without a distinct secondary *a* fringe of semi-erect setulae in addition to main *ad* fringe . . . . . 10
- 10 Wings without the usual sub-basal dark mark. Surstyli of ♂ genitalia as in Text-fig. 97. Hind tibia without a secondary *a* fringe in addition to the normal *ad* fringe . . . . . *P. minuta*
- Wings with the usual sub-basal dark brown mark. Surstyli of ♂ genitalia of slightly different form (Text-figs 98, 104, 108). Hind tibia usually with a row of distinct small semi-erect setulae along its length which form a secondary *a* fringe in addition to the usual *ad* fringe (setulae usually rather irregular) . . . . . 11
- 11 Surstyli of ♂ genitalia rather short and broad in profile, without noticeable curvature (as in Text-figs 98 and 104) . . . . . 12
- Surstyli of ♂ genitalia longer and more slender in profile and distinctly curved (Text-fig. 108) . . . . . *P. regina*
- 12 Hind metatarsus with the setulae of the *ad* row extremely long and conspicuous, much longer than metatarsal diameter. ♂ cerci and surstyli as in Text-fig. 104 . . . . . *P. deserta*
- Hind metatarsus with setulae of the *ad* row short and inconspicuous, not longer than metatarsal diameter. ♂ cerci and surstyli as in Text-fig. 98 . . . . . *P. arida*
- 13 Hind femur with *pv* setae along the basal half. Hind femur with *av* setae of irregular size along its length. Wing without sub-basal dark mark. ♂ cerci and surstyli as in Text-fig. 107. [Western Australia] . . . . . *P. cygnus*
- Hind femur with *pv* setae on the middle third of its length, none on the basal part. Hind femur either with irregular *av* setae and strong hairs along its whole length or with *av* setae confined to apical half. Wings with the usual sub-basal dark mark. ♂ cerci and surstyli as in Text-fig. 99 or Text-fig. 102. [Victoria to Queensland] . . . . . 14
- 14 Hind femur with the *pv* setae very long and strong, very much longer than diameter of femur. Hind femur with the *av* setae and strong hairs present all along its length. Surstyli and cerci of ♂ genitalia as in Text-fig. 99, surstyli broad and truncate and cerci not recurved at tips . . . . . *P. fullerae*
- Hind femur with the *pv* setae weak and few (usually only two or three, sometimes only one) and only about as long as femoral diameter. Hind femur with *av* setae confined to apical half. Surstyli and cerci of ♂ genitalia as in Text-fig. 102, surstyli blade-like with acuminate apices and cerci slightly but distinctly recurved at tips . . . . . *P. victoriae*

### Genus *CHETOGASTER* Macquart

*Chetogaster* Macquart, 1851 : 198 (225). Type-species: *Chetogaster violacea* Macquart, 1851, by monotypy.

*Codium* Enderlein, 1936 : 417. Type-species: *Rutilia oblonga* Macquart sensu Enderlein (mis-identification) [= *Chetogaster violacea* Macquart, 1851], by original designation.

*Chaetogaster*: incorrect subsequent spelling of *Chetogaster* Macquart, without status in nomenclature.

DIAGNOSIS. Facial carina elongate subfusiform or slightly flattened above and tapering ventrally to a sharp narrow ridge, always rather narrow. Epistome very strongly prominent, subnasute, face in profile deeply concave between epistome and carina. Head of ♂ not holoptic, frons very much wider than facial carina, upper eye facets not enlarged. Parafacials bare.



Buccal opening wide in both sexes, several times broader than facial carina. Genal dilation weakly developed, upper margin running obliquely from behind eye to lower margin of gena. Head pollinose, non-metallic. Arista pubescent. Palpi fully developed, sexually dimorphic (slender in males, conspicuously clavate in females). Proboscis with mentum parallel-sided in profile. Prosternum and prosternal membrane bare. Scutellum with apical pair of setae inserted only slightly lower than other marginal setae; total of only three pairs of marginals (fourth supernumerary pair rarely developed); disc of scutellum convex. Postalar callus with two strong setae. Postalar wall bare. Suprasquamal ridge bare. Upper calypter normal. Tegula with normal long wiry posterior setulae. Costal base not explanate (but basal costal fringe sometimes strongly developed). Abdomen with marginal hair or at most only weakly developed setae on tergite venters; T<sub>3</sub> with one pair of erect median marginal setae; intermediate tergites (T<sub>3</sub> and T<sub>4</sub>) with one or two pairs of discal setae, these sometimes feebly developed or absent in ♂. T<sub>5</sub> truncate subconical, without median depression (at most only trace of flattening at extreme apex).

**DISTRIBUTION.** Australia only, from Tasmania and South Australia to Queensland. Apparently unrepresented in Western Australia.

**DISCUSSION.** The correct nomenclature for this genus is considered below before giving any consideration to the characteristics and possible affinities.

Malloch (1927, 1929, 1936), Enderlein (1936) and Paramonov (1954, 1968) have all referred to this genus by the name *Chaetogaster*, an incorrect subsequent spelling of Macquart's name *Chetogaster* that seems to have been first published by Brauer & Bergenstamm (1891 : 418, 1893 : 228); only Townsend (1932 : 40, 1936 : 155, 1938 : 424) has used the correct original spelling. It is necessary to consider this further, as both *Chaetogaster* and *Chetogaster* spellings exist in the literature for a genus of Oligochaete Annelids. The genus *Chaetogaster* in Annelids was described by Baer (1827 : 614) and the name is valid and in current use, but Gervais (1838 : 15) cited Baer's genus as *Chetogaster* and Neave's *Nomenclator Zoologicus* lists Gervais' spelling of the name with the suffixed parenthetical comment '(pro *Chaet*-Baer 1827)'—implying that Gervais' spelling was an intentional emendation of *Chaetogaster* Baer. However, Gervais' work contains no evidence that he intentionally emended the spelling, and his use of the name *Chetogaster* is therefore an incorrect subsequent spelling under Article 33 of the *International Code of Zoological Nomenclature*; it therefore has no status in nomenclature and does not preoccupy *Chetogaster* Macquart, 1851, which name stands valid for the present genus of Tachinidae.

Enderlein (1936) erected the genus *Codium* with *Rutilia oblonga* Macquart cited as the type-species. Paramonov (1968 : 365) found that Enderlein had misidentified *oblonga* Macquart, and that the species that Enderlein called by this name is actually *Chetogaster violacea* Macquart. During the preparation of the present work I have seen the specimens from Adelaide on which Enderlein based *Codium*, and can confirm that they are *violacea* (not *oblonga*), as Paramonov said; the synonymy of *Codium* with *Chetogaster* established by Paramonov (1954) can also, therefore, be confirmed. It should be noted that the true *oblonga* Macquart also belongs to *Chetogaster*, and hence *Codium* is a synonym in any case, even if the cited nominal species is taken to be the type.

Paramonov (1954) placed *Chaetogastrina stolidia* Malloch, the type-species of *Chaetogastrina*, in the genus *Chetogaster*, thereby sinking the generic name *Chaeto-*

*gastrina* as a synonym of *Chetogaster*, and he maintained this synonymy in his later paper on the genus (Paramonov, 1968). Here it is considered that Paramonov was in error, for *stolida* shows scarcely any of the diagnostic characters of *Chetogaster* but—on the contrary—shows all the essential characters of *Paramphibolia* (q.v.); the ♂ sternite 5 and genitalia, taken with the haired suprasquamal ridge, multiple postalar setae, etc. show beyond doubt that the true affinities of *stolida* are with *assimilis* Macquart, the type-species of *Paramphibolia*, and *Chaetogastrina* is here placed as a synonym of *Paramphibolia* (see p. 100).

In his earlier paper, Paramonov (1954) placed three species in *Chetogaster* which he later (Paramonov, 1968) removed to other genera: *C. nigrithorax* (Macquart) and *C. wilsoni* Paramonov he placed in his genus *Ola* Paramonov, 1968, and *C. diversa* Paramonov he placed in his genus *Ruya* Paramonov, 1968. It is here agreed with Paramonov that *nigrithorax*, *wilsoni* and *diversa* do not belong in the genus *Chetogaster*; they are considered not to belong in the Rutiliini at all in the present definition of the tribe and are therefore omitted from further consideration.

The uncertainty over placement of these species is not surprising, for it is by no means certain that *Chetogaster* itself should really be included in the Rutiliini. Many of the characters of the genus fail to conform with those possessed by typical Rutiliines and the genus should perhaps be looked upon as annectant between the Rutiliini and the Prosenini. The narrow facial keel, robust form, haired propleuron, and number of postalar setae (two) and scutellar marginal setae (three pairs including the apicals) give the genus a facies reminiscent of the genus *Billaea* Robineau-Desvoidy from Eurasia and Africa, and *Chetogaster* seems to be an Australian counterpart to the African *Billaea*. The characters of *Chetogaster* certainly make it difficult to differentiate the Rutiliini from the Prosenini in a completely satisfactory way, but it nevertheless seems useful to maintain the two tribes in spite of the existence of some baffling forms that are hard to place in either tribe with confidence. For the present I follow the traditional placement of *Chetogaster* and retain the genus in the Rutiliini, pending better evidence on the real affinities (at the present time nothing is known of the early stages and host-relations of *Chetogaster*).

There is no practical difficulty in distinguishing *Chetogaster* from other genera within the Rutiliini as it differs from all of them by having only two setae on the postalar callus (the normal number in Tachinidae). An interesting feature of the genus, not found elsewhere in the Rutiliini, is the existence of sexual dimorphism in the palpi—those of the male being slender as in other Rutiliines, but those of the female being very conspicuously clubbed. Some *Chetogaster* species (three out of the seven currently recognized species: see key) possess a small tuft of short fine hairs on the upper part of the mediotergite just below the base of the lower calypter, and this, too, is of unusual interest: such infrasquamal setulae (as they are usually termed) occur in a number of unrelated Tachinidae, but are of very rare occurrence in the whole subfamily Proseninae and occur in no other Rutiliini.

The male genitalia and sternite 5 of *Chetogaster* species shed no light on the affinities within the Proseninae. The aedeagus is exactly similar to that of other Rutiliini (though the membranous and the sclerotized parts of the distiphallus are perhaps slightly longer than in most Rutiliines) and the surstyli and cerci show no

unusual features. Within the seven species three different shapes of surstylus occur (Text-figs 45-47) and there are slight differences in the thickness of the cerci when seen in profile: in *oblonga*, *pellucida* and *argentifera* (probably also *auriceps* of which the male is unknown at present) the surstyli are rather long and tapering and the cerci are shorter than the surstyli (Text-fig. 46); in *canberrae* the surstylus is very small in relation to the epandrium and the cerci are much longer than the surstyli (Text-fig. 45); and in *violacea* and *viridis* the surstyli are large, a little more blunt than in the *oblonga* type, and the cerci are wide in profile (Text-fig. 47). The three shapes are easily distinguished from one another, and it is perhaps questionable whether the supposed species in which the male genital conformation is identical are really distinct from one another. But on present evidence it appears best to maintain *viridis* as distinct from *violacea*, and likewise *argentifera* and *pellucida* as distinct from *oblonga*, in spite of the lack of genital differences.

Finally it may be noted here that the holotype of *C. oblonga* (Macquart) conflicts with Paramonov's (1968 : 364) placement of this species in his key: the abdomen is not 'reddish-yellow, semipellucid, with only a narrow, median black stripe' as stated in Paramonov's key, and *oblonga* holotype runs to *gratiosa* in Paramonov's key. Examination of the holotypes of *oblonga* and *gratiosa*, together with other material, indicates that the types are conspecific, and *gratiosa* is therefore placed here as a new synonym of *oblonga*.

#### INCLUDED SPECIES

- Chetogaster argentifera* Malloch. AUSTRALIA (Australian Capital Territory, New South Wales, Victoria). [Holotype examined].
- C. auriceps* Paramonov. AUSTRALIA (Queensland).
- C. canberrae* Paramonov. AUSTRALIA (Victoria to Queensland). [Holotype examined].
- C. oblonga* (Macquart). AUSTRALIA (New South Wales, Victoria). [Holotype examined].
- gratiosa* Paramonov **syn. n.** [Holotype examined].
- C. pellucida* Paramonov. AUSTRALIA (New South Wales). [Holotype examined].
- C. violacea* Macquart. AUSTRALIA (Tasmania to Queensland). [Holotype examined].
- C. viridis* Malloch. AUSTRALIA (New South Wales, Queensland). [Holotype examined].

#### KEY TO SPECIES OF THE GENUS *CHETOGASTER*

- 1 Calyptrae bright orange-yellow. Wings conspicuously yellow or yellow-orange anterobasally (as all basal veins with this colour) and faintly but distinctly tinged with yellowish or smoky brownish colour elsewhere. Infrascumal setulae present.<sup>3</sup> ♂ surstyli and cerci in profile as in Text-fig. 47 (cercus rather broad and sharply narrowing at tip). Large species, length normally 16-20 mm. . . . . 2

<sup>3</sup> The infrascumal setulae consist of a small tuft of hairs immediately below the base of the lower calypter on the mediotergite. They are very small and careful examination is required.



- Calyptrae not yellow, either white or partly to completely smoky brown. Wings entirely clear hyaline with dark veins. Infrascapular setulae absent (except in *canberrae*). ♂ surstyli and cerci not of this shape, cerci more slender (Text-figs 45 & 46). Smaller species, length normally 10-16 mm . . . . . 3
  - 2 Abdomen metallic green to blue-violet on dorsum and violaceous on venter; abdominal venter with scarcely any trace of whitish pollinosity visible to naked eye in any light. Mesonotum dark green to blue-green with the pollinosity distinctly tinged with yellow. Scutellum green to violet. ♂ vertex 0.12-0.14 of head-width. Abdominal T<sub>5</sub> with unusually strong, often distinctly spiniform, bristling *C. viridis*
  - Abdomen bluish black with purplish tinge dorsally and deep violet or reddish violet ventrally; venter with white pollinosity extremely conspicuous to naked eye when abdomen viewed from behind. Mesonotum very dark blue-black or violaceous black with the pollinosity white. Scutellum dark violet (sometimes with brownish tinge) to purplish black. ♂ vertex consistently wider, 0.15-0.17 of head-width. Abdominal T<sub>5</sub> with strong bristling but the setae long and not at all spiniform *C. violacea*
  - 3 Palpi and epistome black or brownish black. Upper and lower calypter both dark smoky brown. Infrascapular setulae present (but minute and inconspicuous). ♂ genitalia with surstylus shaped as in Text-fig. 45, cerci much longer than the relatively small surstyli . . . . . *C. canberrae*
  - Palpi and epistome yellow or tawny yellow. Calyptrae white or mainly white, if largely smoky brown then at least basal half of upper calypter white. Infrascapular setulae absent. ♂ genitalia with surstylus shaped as in Text-fig. 46, cerci shorter than surstyli . . . . . 4
  - 4 Ground colour of abdomen tawny yellowish or very pale reddish brown with a conspicuous black median vitta (abdomen distinctly pallid to naked eye on either side of the black mid-line). Scutellum dark brown with little or no trace of metallic colour . . . . . *C. pellucida*
  - Ground colour of abdomen very dark metallic greenish or violaceous, appearing dark brownish in some lights only, darkest mid dorsally but without a definite black vitta. Scutellum distinctly metallic steely blue-black or purplish violet . . . . . 5
  - 5 Third antennal segment uniformly bright orange. Parafacials bright yellow pollinose. Ground colour of parafrontals tawny reddish. Calyptrae almost all white, only the border darkened. Abdomen with pollinosity of the dorsum almost entirely whitish (at most only yellowish brown near the mid-line) *C. argentifera, C. auriceps*
- [*C. auriceps* is known only from the ♀ holotype which has not been examined. Paramonov (1968) distinguished it from *argentifera* mainly by the yellow pollinose, instead of silvery whitish pollinose, parafrontals. It appears doubtful whether *auriceps* is specifically distinct from *argentifera*.]
- Third antennal segment partly or mainly brown, at least infusate along one edge. Parafacials mainly whitish pollinose (if lower parts somewhat yellowish pollinose as in some ♀ specimens then calyptrae largely smoky brown). Ground colour of parafrontals blackish. Calyptrae at least faintly infusate over much of their surface or lower calypter broadly darkened against hind edge, calyptrae of ♀ usually dark smoky brown except for basal half of upper calypter. Abdomen with pollinosity of the dorsum mainly dark yellowish brown or coppery brown on the median third (the darker pollinosity of the middle of the abdomen contrasting with the whitish lateral pollinosity in some lights) . . . . . *C. oblonga*

## LECTOTYPE DESIGNATIONS

Lectotypes are newly designated in this section for the 29 species-group taxa of Rutiliini which were originally based upon syntypes and for which no previous valid

lectotype designations or restrictions have been published; the lectotypes have been appropriately labelled. The names are listed in alphabetical order under their original generic assignments.

For some taxa not all of the original syntypes have been located and examined, but all available syntypes other than the lectotypes (i.e. the paralectotypes) are noted in the following list and have been labelled as paralectotypes.

It should be noted that several of Enderlein's types have labels in his handwriting on which the generic name is different from that with which the specific name was combined in publication, and attention has been drawn to such discrepancies where they occur by quoting the labels. Enderlein (1936) evidently discovered, while his paper was in press, that his genus *Habrota* was based upon the same type-species as *Chrysorutilia* Townsend, 1915, and that some of his new species should be assigned to Townsend's genus; thus these were published in *Chrysorutilia* but remained labelled as *Habrota*; but, apart from this, there are instances where Enderlein seems simply to have changed his mind on the generic position of some new species between the time of labelling the types and publishing the paper. However, despite these discrepancies between label name and published name, there is never any doubt about the identity of the types for any nominal species-group taxon.

***Chrysorutilia angustigena* Enderlein, 1936 : 403.**

Described from two ♂ syntypes from the same type-locality. LECTOTYPE ♂. AUSTRALIA, Queensland, Herberton, i.1910 (*J. P. Dodd*) (in Museum für Naturkunde der Humboldt-Universität, Berlin). The lectotype bears Enderlein's name label 'Habrota angustigena Type Enderl. ♂'.

***Chrysorutilia caeruleata* Enderlein, 1936 : 402.**

Described from ♂ and ♀ syntypes (total number not clearly stated) from the same type-locality on different dates. LECTOTYPE ♂. AUSTRALIA, Western Australia, Marloo Station, ix.1935 (*A. Goerling*) (in Museum für Naturkunde der Humboldt-Universität, Berlin). Paralectotypes: 2 ♂, 1 ♀, same data as lectotype except dates ix. 1934 for one ♂ and ii.1935 for ♀ (♂♀ in MNHU, Berlin; ♂ with date ix.1934 in BMNH, London).

The lectotype bears Enderlein's name label 'Habrota caeruleata Type Enderl. ♂', and the paralectotypes cited also bear Enderlein labels with the 'Habrota' generic name. The ♀ paralectotype is probably mis-associated with the lectotype.

***Chrysorutilia caesia* Enderlein, 1936 : 402.**

Described from one ♂ and one ♀ syntypes from 'Australien' and four ♀ syntypes from Queensland, of which the ♂ is designated. LECTOTYPE ♂. AUSTRALIA (*Clement*) (in Museum für Naturkunde der Humboldt-Universität, Berlin). Paralectotype: one ♀, same data as lectotype (MNHU, Berlin).

Enderlein's name label is lost from the lectotype specimen (though its identity as the original ♂ syntype is certain from the label 'Australien Clement' and agreement with description), but the paralectotype ♀ has Enderlein's name label 'Rutilia caesia Type Enderl. ♀'.

***Chrysorutilia goerlingiana* Enderlein, 1936 : 404.**

Described from two ♀ syntypes from the same type-locality. LECTOTYPE ♀. AUSTRALIA, Western Australia, Wurarga, Marloo Station, i.1935 (*A. Goerling*) (in Museum für Naturkunde der Humboldt-Universität, Berlin). The lectotype bears Enderlein's name label 'Rutilia goerlingiana Type Enderl. ♀'.

***Chrysurutilia lineata*** Enderlein, 1936 : 407.

Described from one ♂ and one ♀ syntypes from the same locality. LECTOTYPE ♂. AUSTRALIA, Western Australia, Wurarga, Marloo Station (*A. Goerling*) (in Museum für Naturkunde der Humboldt-Universität, Berlin). The lectotype bears Enderlein's name label 'Habrota lineata Type Enderl. ♂'.

***Chrysurutilia rufibarbis*** Enderlein, 1936 : 405.

Described from one ♀ syntype from 'Nord-Australien', and one ♂ and one ♀ syntypes from Western Australia, of which the ♂ is here designated. LECTOTYPE ♂. AUSTRALIA, Western Australia, Wurarga, Marloo Station, ix-x.1934 (*A. Goerling*) (in Museum für Naturkunde der Humboldt-Universität, Berlin). Paralectotype: one ♀, same data as lectotype except date x-xi.1934 (MNHU, Berlin).

The lectotype bears Enderlein's name label 'Habrota rufibarbis Type Enderl. ♂' and the year date is 1934 (not 1935 as Enderlein cited). The paralectotype ♀ (which is much larger than, and perhaps not conspecific with, the lectotype) also has 'Habrota' on Enderlein's name label.

***Chrysurutilia splendida* var. *confluens*** Enderlein, 1936 : 407.

Described from one ♀ syntype from Western Australia, one ♀ syntype from Sydney, and a ♂ and five ♀ syntypes from Queensland. LECTOTYPE ♂. AUSTRALIA, Queensland (in Museum für Naturkunde der Humboldt-Universität, Berlin). Paralectotype: one ♀, AUSTRALIA, Western Australia, Swan River (*Dämél*) (MNHU, Berlin).

The lectotype bears Enderlein's name label 'Habrota splendida (Donov. 1805) var. confluens Type Enderl. ♂'. The ♀ paralectotype (which has pale pleural hair and is probably wrongly associated) is labelled 'Rutilia splendida Guér. var. confluens Type Enderl. ♀'.

***Dexia zabirna*** Walker, 1849 : 863.

Described from two ♂ syntypes with identical data from the British Museum collection, each of which bears an old accession label reading '47 109' on one side and 'W. Austr-alia' on the other, and a pencilled locality label in Austen's handwriting. LECTOTYPE ♂. AUSTRALIA, Western Australia, Perth (*G. Clifton*) (in British Museum (Natural History), London). Paralectotype: one ♂, same data as lectotype (BMNH, London).

***Donovanius fulgidus* var. *nigrbasis*** Enderlein, 1936 : 411.

Described from an unstated number of ♂ and ♀ syntypes from the same locality. LECTOTYPE ♂. AUSTRALIA, Western Australia, Wurarga, Marloo Station, 6.vi.1935 (*A. Goerling*) (in Museum für Naturkunde der Humboldt-Universität, Berlin). Paralectotype: one ♀, same data as lectotype except date ix.1935 (MNHU, Berlin).

***Idania ralumensis*** Enderlein, 1936 : 409.

Described from two ♀ syntypes with the same data. LECTOTYPE ♀. PAPUA NEW GUINEA, New Britain, Ralum, 30.viii.1896 (*F. Dahl*) (in Museum für Naturkunde der Humboldt-Universität, Berlin). The lectotype bears Enderlein's name label 'Rutilia ralumensis Type Enderl. ♀'.

***Laccura engeli*** Enderlein, 1936 : 431.

Described from two ♀ syntypes with the same data. LECTOTYPE ♀. INDONESIA, Banda Islands, Run [=Roön] Island (south of Ceram) (in Museum für Naturkunde der Humboldt-Universität, Berlin).

***Pancala eos*** Enderlein, 1936 : 423.

Described from three ♂ and seven ♀ syntypes from Celebes. LECTOTYPE ♂. INDONESIA, Celebes, Bonthain, Wawa Karaeng, 1100 m, viii.1931 (*G. Heinrich*) (in Museum für Naturkunde der Humboldt-Universität, Berlin). Paralectotypes: one ♂, two ♀, same data as lectotype (♂ in BMNH, ♀♀ in MNHU); one ♀, same data as lectotype except date ix-x.1931 (MNHU).

***Pancala gemmata*** Enderlein, 1936 : 424.

Described from one ♀ and two ♂ syntypes from New Britain. LECTOTYPE ♂. PAPUA NEW GUINEA, New Britain, Ralum, Karakaul, 30.viii.1896 (*F. Dahl*) (in Museum für Natur-



kunde der Humboldt-Universität, Berlin). The lectotype bears Enderlein's name label 'Chromocharis gemmata Type Enderl. ♂'.

***Pancala gemmata* var. *viridescens*** Enderlein, 1936 : 424.

Described from two ♂ syntypes with the same data. LECTOTYPE ♂. PAPUA NEW GUINEA, New Britain, Kinigunang (*C. Ribbe*) (in Museum für Naturkunde der Humboldt-Universität, Berlin). The lectotype bears Enderlein's name label 'Pancala gemmata n. sp. var viridescens Type Enderl. ♂'.

***Prosenostoma nigripes*** Enderlein, 1936 : 435.

Described from two ♂ syntypes from Queensland, one from Cairns and the other from Herberton. LECTOTYPE ♂. AUSTRALIA, Queensland, Herberton, 3700 ft, ii.1911 (*Dodd*) (in Museum für Naturkunde der Humboldt-Universität, Berlin). The lectotype bears Enderlein's name label 'Agalmia nigripes Type Enderl. ♂'.

***Psaronia bisetosa*** Enderlein, 1936 : 414.

Described from two ♀ syntypes from Western Australia. LECTOTYPE ♀. AUSTRALIA, Western Australia, Wurarga, Marloo Station, 1935 (*A. Goerling*) (in Museum für Naturkunde der Humboldt-Universität, Berlin).

***Pseudoformosia pauper*** de Meijere, 1904 : 178.

Described from three ♂ syntypes collected by Bernstein in northern Halmahera. LECTOTYPE ♂. INDONESIA, Moluccas, N. Halmahera (*Bernstein*) (in Rijksmuseum van Natuurlijke Historie, Leiden). Paralectotype: one ♂, same data as lectotype (in British Museum (Natural History), London).

The syntypes cited above each bear a printed label reading 'Bernstein Noord Halmaheira'. The Leiden Museum collection contains, standing with the lectotype, two ♂ specimens each with a similar printed label reading 'Bernstein Morotai' but these specimens have no type-status. Similarly, the collection of the Zoölogisch Museum, Amsterdam, contains one ♂ and one ♀ specimen of *pauper* with the printed 'Bernstein Morotai' labels, but these specimens also have no type-status.

***Rutilia atribasis*** Walker, 1861b : 288.

The type-material consists of two conspecific ♀ syntypes, though the number of specimens was not stated by Walker. LECTOTYPE ♀. INDONESIA, Moluccas, Batjan [publ. as 'Batchian'] (*A. R. Wallace*) (in British Museum (Natural History), London). Paralectotype: one ♀, same data as lectotype (in University Museum, Oxford).

***Rutilia desvoidyi*** Guérin-Méneville, 1843 : 269.

Described from three syntypes (two ♂, one ♀) from 'Nouvelle-Hollande', of which the males have not been located and are presumed lost and of which the ♀ syntype (here designated) is in Paris. LECTOTYPE ♀. AUSTRALIA (no other data) (in Muséum National d'Histoire Naturelle, Paris, standing in Macquart collection under reference number 2310).

The lectotype bears a label in Guérin-Méneville's writing which reads 'Rutilia Desvoidyi. guer. R. vivipara. Rob. D. p. 321.3. non vivipara f. N.elle hollande', this label making reference to the fact that Guérin-Méneville considered that *Rutilia vivipara* of Robineau-Desvoidy was a misidentification of the true *R. vivipara* (Fabricius). There is no known evidence to support Guérin-Méneville's supposition, and as the lectotype of *desvoidyi* is conspecific with the neotype of *Rutilia vivipara* (Fabricius) (herein designated) the name *desvoidyi* falls as a synonym of *vivipara*.

***Rutilia inornata*** Guérin-Méneville, 1843 : 268.

Described from five ♀ syntypes from 'Nouvelle-Hollande' recorded in the original description as '5 individus femelles provenant du même marchand, 2 dans la coll. du Muséum, 3 dans la mienne'; the museum referred to is the Natural History Museum in Paris. The two syntypes in Paris Museum still exist there as part of the Macquart collection, but the other three syntypes

have not been located and are presumed lost. LECTOTYPE ♀. AUSTRALIA (no other data) (in Muséum National d'Histoire Naturelle, Paris, standing in Macquart collection under reference number 2311). Paralectotype: one ♀, same data as lectotype (MNHN).

Both lectotype and paralectotype are in bad condition, the latter consisting only of the thoracic shell and right wing; the lectotype is eaten out in places, lacks antennae and mouthparts and has been glued in places. The lectotype bears a label in Guérin-Méneville's writing which reads 'Rutilia inornata. guer. ic. R. a. (type) Nelle holl.'

***Rutilia lucigena*** Walker, 1861a : 242.

Described from both sexes but number of specimens not stated, though actually consisting of three conspecific syntypes. LECTOTYPE ♂. INDONESIA NEW GUINEA, Dorey (*A. R. Wallace*) (in British Museum (Natural History), London). Paralectotypes: one ♂, one ♀, same data as lectotype (BMNH).

***Rutilia pretiosa*** Snellen van Vollenhoven, 1863 : 15.

Described from one ♂ and one ♀ syntype, both still in Leiden Museum. LECTOTYPE ♂. INDONESIA, Moluccas, Ternate (*Bernstein*) (in Rijksmuseum van Natuurlijke Historie, Leiden). Paralectotype: one ♂, same data as lectotype except collector Forsten (also in RMNH, Leiden).

The lectotype bears a circular white label with the words 'Bernst. Ternate' in ink, and the paralectotype bears a similar label with the words 'Forsten Ternate'.

***Rutilia pubicollis*** Thomson, 1869 : 530.

Described from an unstated number of ♂ specimens from 'Sidney'; the type-material actually consists of two identically labelled and set syntypes in Stockholm. LECTOTYPE ♂. AUSTRALIA, New South Wales, Sydney (*Kinb.*) (in Naturhistoriska Riksmuseum, Stockholm). Paralectotype: one ♂, same data as lectotype (NR, Stockholm).

Each of the two syntypes has a small rectangular printed label reading 'Sidney' and another rectangular printed label reading 'Kinb.'

***Rutilia saturatissima*** Walker, 1861b : 287.

Described from both sexes without statement of the number of specimens. Type-material consists of one syntype of each sex (conspecific). LECTOTYPE ♂. INDONESIA, Moluccas, Batjan [publ. as 'Batchian'] (*A. R. Wallace*) (in British Museum (Natural History), London). Paralectotype: one ♀, same data as lectotype (BMNH).

***Rutilia speciosa*** Erichson, 1842 : 273.

Erichson did not state the sex of the original material or the number of specimens, but Enderlein (1936 : 430) showed that there were three ♀ syntypes collected by Schayer in Tasmania which he referred to as 'die Typen Erichson's'. Two of these syntypes have been seen. LECTOTYPE ♀. AUSTRALIA, Tasmania (*Schayer*) (in Museum für Naturkunde der Humboldt-Universität, Berlin). Paralectotype: one ♀, same data as lectotype (MNHU, Berlin).

The lectotype bears two rectangular blue labels with the handwritten words 'Vandiem. Schayer' and 'Speciosa Er.' respectively (these probably both in Erichson's hand), and also a yellow rectangular label with the printed number '3554'. The paralectotype bears a label reading 'Tasmanien Schayer' in Enderlein's writing. The third syntype has not been seen but is probably still in the MNHU, Berlin, collection.

***Rutilia spinipectus*** Thomson, 1869 : 530.

Described from an unstated number of specimens of both sexes from 'Sidney'; the type-material consists of one ♂ and one ♀ syntype. LECTOTYPE ♂. AUSTRALIA, New South Wales, Sydney (*Kinb.*) (in Naturhistoriska Riksmuseum, Stockholm). Paralectotype: one ♀, same data as lectotype (NR, Stockholm).

Each of the syntypes has a small rectangular printed label reading 'Sidney' and another rectangular printed label reading 'Kinb.'

***Rutilia volucelloides*** Walker, 1861b : 289.

Walker described this species from both sexes, but only a single syntype now exists; this is

here designated as lectotype. LECTOTYPE ♂. INDONESIA, Moluccas, Batjan [publ. as 'Batchian'] (*A. R. Wallace*) (in British Museum (Natural History), London).

*Senostoma flavipes* Brauer & Bergenstamm, 1889 : 126 (58).

Brauer & Bergenstamm described both the ♂ and the ♀ of this species, and the original material consisted therefore of at least two syntypes; the locality was cited as 'Neuholland'. Engel (1925 : 375) saw the original material and referred to it as '♂ and ♀ Neu Holland (Typen No. 38 u. 39)', clearly indicating that the syntypes consisted of one of each sex. The ♂ syntype cannot now be found in the Vienna Museum collection, but the ♀ syntype is still present there: it is here designated as lectotype. LECTOTYPE ♀. ['NEW HOLLAND'] (in Naturhistorisches Museum, Vienna).

The lectotype has a square white label inscribed in slightly faded ink 'Dup. n 39', the number 39 conforming with the number cited for the ♀ syntype by Engel.

Townsend (1932, 1938) misunderstood the type-material of *flavipes* and the specimens from Western Australia cited by him as 'Holotype', and in his notes in the U.S. National Museum, Washington, as 'Holotype' and 'Paratype' have no type-status (see further discussion of this in the treatment of the subgenus *Microrutilia*).

Direct comparison of the lectotype ♀ of *flavipes* Brauer & Bergenstamm with the lectotype ♀ of *fulviventris* Bigot shows that the types are in perfect agreement and unquestionably conspecific. Hence the name *flavipes* is sunk as a new synonym of *fulviventris* (see p. 90).

*Tachina inusta* Wiedemann, 1830 : 306.

Described from an unstated number of specimens of unstated sex from 'Port Jackson in Neuholland' (i.e. Sydney), and recorded by Wiedemann as in the Berlin Museum. Enderlein (1936 : 412) found four ♀ specimens collected by Eschscholtz at Port Jackson which he recorded as 'Typen Wiedemann's', of which two have been examined and one here designated as lectotype. LECTOTYPE ♀. AUSTRALIA, New South Wales, Sydney [publ. as 'Port Jackson'] (*Eschscholtz*) (in Museum für Naturkunde der Humboldt-Universität, Berlin). Paralectotype: one ♀, same data as lectotype (MNHU, Berlin).

The lectotype bears a rectangular faded bluish-grey label with the words 'P. Jackson. Esch.', and another faded bluish grey label reading 'inusta Tachin. inusta Wied.', the writing on both labels probably being Wiedemann's (as it closely resembles the writing on Wiedemann's type labels in Copenhagen); in addition the lectotype has a printed label '3553'. The paralectotype is labelled 'Australien Port Jackson Eschscholtz' in Enderlein's writing.

#### NEOTYPE DESIGNATIONS

The types of some of the Rutiliini described by the early workers (i.e. before 1850) are lost and have never been reported in the literature as having been seen by anyone since the time of description. The type-material is considered to be certainly lost in the case of fifteen nominal species described by Donovan, Fabricius, Guérin-Méneville, Macquart, Robineau-Desvoidy and Walker. Most of the names involved apply to, or are believed on all available evidence to apply to, distinct species and to be taxonomically valid; several of them have been in use for many years, but have not always been applied to the same species. Some of the supposedly single species to which some of these old names have been applied are now known to be complexes of very closely allied species, and to disentangle past confusion (as well as to obviate the possibility of future misidentifications) it is considered highly desirable to establish neotypes so that the meanings of the names can be fixed.

Opinions vary among taxonomists on the desirability of neotypes: some workers maintain that they are scarcely, if ever, justified and others regard them as desirable for every case where there is no surviving original type-material. I take an inter-



mediate viewpoint and regard them as desirable in groups that have been much confused with diverse applications of the same names (with a high potential for continuing future confusion), but only for names that are maintained as valid or are unfamiliar synonyms for which there is good reason to have neotypes. In the present work, neotypes are established for twelve of the fifteen names for which original type-material no longer exists; the other three names (*australasia* Gray, *fulvipes* Guérin-Méneville, and *vidua* Guérin-Méneville) have been accepted for many years as junior synonyms, there are no reasons for doubting the rightness of the synonymies, and neotypes are not therefore established for these names.

Special care has been taken here to ensure that the neotypes proposed are validly designated according to the rather stringent terms of Article 75 of the *International Code of Zoological Nomenclature* (1961). The present paper contains the results of revisory work based upon a study of the whole tribe Rutiliini, during which it has been found necessary for neotypes to be established in the interests of stability of nomenclature, by resolving confused and doubtful identities (Article 75 (a) (i)). For each neotype it is considered that the qualifying conditions specified in Article 75 (c) (1-6) are fully satisfied in the present work for the following reasons (in order of the six qualifying conditions): (1) The placement of the species for which the neotype stands in a key to all the species of its higher taxon, together with a figure of the male genitalia and a bibliographic reference to the original description, constitute a statement of the characters which (in my view) differentiate the species for which the neotype is designated; (2) The data is published here for each neotype and each has been appropriately labelled; (3) Original material has been personally searched for in all likely museum collections, none has been found and none has been mentioned by any author since the time of description, from which facts it is concluded that all original type-material of each nominal species for which a neotype is designated is either lost or destroyed; (4) The characters of each neotype are completely consistent with the original description, except that a male specimen has usually been chosen as neotype (for the male has better characters than the female) even though the original description or figure was based or apparently based on a female specimen; (5) The exact provenance of the original material is usually uncertain, in which case the neotype specimen is chosen from an area which is considered a likely or possible original provenance having regard to all the circumstances of the time when the species was described (e.g. early coastal development of Australia); (6) The museum depository is named for each neotype (the neotypes are deposited either in the Australian National Insect Collection at Canberra or in the British Museum (Natural History) in London, which maintain research collections and make types available for study).

The twelve neotypes designated are all for nominal species belonging in the genus *Rutilia* Robineau-Desvoidy s.l.; ten of them (viz. *chersipho*, *decora*, *formosa*, *imperialis*, *lepida*, *pellucens*, *regalis*, *setosa*, *splendida* and *vivipara*) apply to nominal species of which the names are considered taxonomically valid in the present work, and the other two (*durvillei* and *serena*) apply to newly established synonyms. The twelve nominal species belong in three subgenera of *Rutilia* and their neotypes therefore show the subgeneric characteristics which define the subgenera (see subgeneric

diagnoses): *chersipho*, *decora*, *formosa*, *imperialis* and *splendida* belong in the subgenus *Chryсорutilia* Townsend; *lepida*, *pellucens* and *regalis* in the subgenus *Donovanius*; and *setosa* and *vivipara* in *Rutilia* s.str.; *serena* is considered to be a synonym of *rubriceps*, a species of *Chryсорutilia*, and *durvillei* is a synonym of *vivipara* (the type-species of *Rutilia*).

The names of the nominal species for which neotypes are designated in the following list are arranged in alphabetical order of their original binomina; data and depository of each neotype are cited first, followed by any appropriate annotation.

***Dexia chersipho*** Walker, 1849 : 864.

NEOTYPE ♂. AUSTRALIA, Western Australia, Waroona, 21.xi.1908 (*G. F. Berthoud*) (in British Museum (Natural History), London).

This species was described from a specimen of unknown locality in Children's collection. The specimen is not among those in the BMNH from Children's collection, has never been located and appears certainly lost. Walker's description of the very distinctive colour pattern and his placement in the *Rutilia* group of *Dexia* fit perfectly the common Western Australian species later called *erichsonii* Engel, 1925, and there is considered to be no doubt about the identity of *chersipho*: it is an older name for *erichsonii*, which is herein placed in new synonymy with *chersipho*.

***Dexia serena*** Walker, 1849 : 865.

NEOTYPE ♀. INDIA, Maharashtra, Purandhar, near Poona, c. 3000 ft, on bush (*E. P. Sewell*) (in British Museum (Natural History), London).

Described from a female specimen from Madras presented to BMNH by Walter Elliott but now lost. The description clearly indicates that this is the only species of *Chryсорutilia* so far described from India, and fits exactly with the holotype female of *Rutilia nitens* Macquart, 1851, from India. Enderlein (1936 : 403) placed *nitens* as a synonym of *serena* and this synonymy is here upheld, the primary types being undoubtedly conspecific. In the present revisionary work, however, no differences have been found between the Indian material and *Rutilia rubriceps* Macquart from Australia, so that both *serena* and *nitens* are herein treated as new synonyms of *rubriceps*.

***Musca splendida*** Donovan, 1805 : plate figure, unpaginated description.

NEOTYPE ♂. AUSTRALIA, Queensland, Brisbane, 8.xi.1907 (*A. J. C. Wightman*) (in British Museum Natural History), London).

Townsend's (1932 : 39; 1938 : 416) statement of 'Ht [=holotype] in London' for *splendida* is based on the mere supposition that Donovan's type must be in the British Museum (Natural History). In fact there is no such specimen in BMNH collection, and no original material has ever been located. Donovan's figure was based on a specimen from McLeay's cabinet from New South Wales, but the specimen has not been found in the McLeay Museum, Sydney. Donovan's coloured plate of *splendida* shows, at natural size, a large metallic blue-green *Rutilia* species with yellow head and metallic spots on the abdomen, clearly a species of *Chryсорutilia*. The name *splendida* as used in the literature refers to a complex of three species characterized by three quite distinct forms of male genitalia, one of which was figured by Malloch (1929 : 296) under the name *splendida*. As the species figured by Malloch is apparently the commonest of the three, occurring widely in New South Wales and Queensland (and therefore the most likely to have been seen by Donovan), it is from this species that the neotype has been designated and to which the name *splendida* is therefore restricted.

Malloch (1928c : 660) and Townsend (1938 : 416) cited the publication date of *splendida* as 1798 in error. The correct date is 1805, as cited by Enderlein (1936 : 407).

***Rutilia decora*** Guérin-Méneville, 1843 : 266.

NEOTYPE ♂. AUSTRALIA, Queensland, Burpengary (*T. L. Bancroft*) (in British Museum (Natural History), London).

This species was described from a single female from 'Nouvelle-Hollande'. The holotype is lost, and Townsend's (1932 : 38) statement of a female holotype in Paris is in error: there are no specimens remaining in Paris of *decora* among Guérin-Méneville's material (which is scattered in Macquart's collection), but there are specimens standing in Macquart's collection under the name *decora* which are later determined material. The description of *decora* is very full and detailed and certainly applies to a species of the *splendida*-complex of *Chrysorutilia*, and Malloch (1928c : 660), Townsend (1932 : 38-39) and Enderlein (1936 : 407) treated *decora* as a synonym of *splendida* (though Enderlein accorded it varietal status). In the present revision it is considered best to apply the name to a species which is very closely allied to *splendida* but has distinctly different male genitalia (see key and Text-figures); this recovers the name *decora* from synonymy and obviates the need to add a new name to the literature. It is considered far better to bring the old name *decora* into use for a valid species (which exactly fits the original description) than to describe a new species unnecessarily.

***Rutilia durvillei*** Robineau-Desvoidy, 1830 : 321.

NEOTYPE ♂. AUSTRALIA, New South Wales, Hawkesbury River, 28.xi.1914 (in British Museum (Natural History), London).

Robineau-Desvoidy described this nominal species from a male specimen collected at Port Jackson (i.e. Sydney harbour) by Captain Dumont-Durville and given to him by Guérin-Méneville. The neotype specimen is from the Hawkesbury River, which enters the sea just north of Port Jackson. Robineau-Desvoidy's description refers to a specimen closely resembling *vivipara* Fabricius and having a bluish trace on the thoracic dorsum and a series of stiff bristles on each abdominal segment ('une série de poils raides et noirs au sommet de chaque segment'). This description makes it clear that the type had conspicuous bristling on the third abdominal tergite (apparent second segment) as well as on the other segments, and from this statement (plus the remainder of the description) it seems certain that the name *durvillei* alluded to a species of the subgenus *Rutilia* s. str. In this subgenus only *vivipara* (the type-species) has the abdominal bristling as bold and conspicuous as Robineau-Desvoidy's description implies, and I believe it to be almost certain that the *durvillei* type was a specimen of *vivipara* (some specimens of the latter have a slight bluish or purplish tinge on the scutum). I have therefore designated as neotype of *durvillei* a male specimen of *vivipara* (a specimen considered unquestionably conspecific with the neotype of *vivipara* herein designated also); the name *durvillei* is therefore disposed of in synonymy with *vivipara*, which is a better course than bringing the name into use on shaky evidence for some valid species.

***Rutilia formosa*** Robineau-Desvoidy, 1830 : 320 (name attributed to 'Donovan' in error).

NEOTYPE ♂ AUSTRALIA, New South Wales, near Lake George, 25.xi.1953 (*S. J. Paramonov*) (in Australian National Insect Collection, Canberra).

Robineau-Desvoidy described this species from a specimen of unstated sex that stood in Count Dejean's collection from 'Nouvelle-Hollande'. Under his name *Rutilia formosa*, Robineau-Desvoidy attributed the name to Donovan with the statement '*Musca formosa*, Donovan' and after the description wrote 'Donovan l'a décrite et figurée parmi les insectes remarquables de ce pays' (i.e. Australia). It appears that Robineau-Desvoidy wrote '*formosa*' in error, as Donovan described and figured only one species of Rutiliine, namely *Musca splendida*; there is no such nominal species as *formosa* Donovan. Although Robineau-Desvoidy's description may have been intended as a redescription of *splendida* Donovan there is no conclusive evidence of this, and (in common with other workers on the group) I therefore accept *Rutilia formosa* Robineau-Desvoidy as a nominal species originally based upon a type-specimen. This type-specimen, along with all the other Diptera from Count Dejean's collection, is now lost and there are no specimens in Robineau-Desvoidy's collection or any other authoritatively identified specimens by which the identity of *formosa* R.-D. can be determined. Robineau-Desvoidy's



description, however, is clearly that of a species of the subgeneric concept *Chryсорutilia* and contains certain clues on which species he must have had before him. Most of the *Chryсорutilia* species from Australia have brilliant yellow heads, but the head of *formosa* is described as having a red interfrontal area ('Frontaux rouges') and the remainder mainly whitish ('côtes du front et face blanchâtres'); the lower part of the face is described as bluish, which appears to suggest that the epistome is rather metallic. One species that is common in eastern Australia fits this description very well, as it has the parafrontals and parafacials whitish pollinose (therefore contrasting with the red interfrontal area) and often shows distinct metallic colour on the epistome, and it is therefore from this species that the neotype specimen has been designated for *formosa* R.-D. Other characters of the species, including the male genital characters, are indicated in the accompanying key and text-figure.

It should be noted that Robineau-Desvoidy's description does not fit *splendida* (which is a species with brilliant yellow head), so that even if his use of *formosa* and attribution to Donovan were a lapsus for *splendida* it is clear that he did not have the true *splendida* before him. Townsend (1938 : 413) cited a '*Musca formosa* [Donovan] (1805)' but there is no such nominal species in the works of Donovan; he also stated that *formosa* R.-D. is a synonym of *retusa* Fabricius, but the holotype of the latter still exists and has been examined and found to be completely distinct from any of the species of *Chryсорutilia* (belonging in fact in the subgenus *Donovanius*). Townsend's (1915) genus *Chryсорutilia* rests nomenclaturally upon the statement 'Genotype, *Rutilia formosa* Desvoidy, 1830, Essai Myodaires, 320' without any account of the characters defining the taxon; since no characters are cited in this original 'description' it is here presumed that no conflict exists between Townsend's original meaning of *Chryсорutilia* and the meaning given to it in the present work by designation of a neotype for *formosa* R.-D., the type-species. It should be recorded, though, that Townsend's (1938) later meaning of *Chryсорutilia* (after he had synonymized *formosa* with *retusa* without any confirmatory evidence) is different and his definition in *Manual of Myiology* seems to apply better to the concept *Donovanius* Enderlein, here regarded as a valid subgenus. There were no specimens cited by Townsend in the original (1915) proposal of *Chryсорutilia*, and I hold therefore that Enderlein's (1936 : 401-408) interpretation of *Chryсорutilia* Townsend, which is in conformity with the present interpretation based upon neotype designation for the cited type-species, is taxonomically correct—even if specimens later held to be *formosa* by Townsend belong to another concept. (It would not be a case of misidentified type-species because no specimens were cited in the original description by which Townsend's meaning of *formosa* was established; the type-species of *Chryсорutilia* must therefore be the nominal species named by Townsend as type-species, i.e. the *formosa* R.-D. whose characters are now pinned down by neotype designation.)

***Rutilia imperialis*** Guérin-Méneville, 1843 : 265.

NEOTYPE ♂. AUSTRALIA, New South Wales, Mt Wilson, 2.i.1953 (*M. F. Day*) (in Australian National Insect Collection, Canberra).

This species was described from a male and a female from 'Nouvelle-Hollande' without further data. It occurs mainly in south-eastern Australia (New South Wales and Victoria) and as much of the early collecting was done in New South Wales the neotype specimen designated is from that state.

***Rutilia lepida*** Guérin-Méneville, 1843 : 268.

NEOTYPE ♂. AUSTRALIA, Australian Capital Territory, Blundell's, near Canberra, 19.iv.1948 (*Paramonov*) (in Australian National Insect Collection, Canberra).

This species was described from a specimen from 'Nouvelle-Hollande' without further data. The careful description of Guérin-Méneville leaves really no doubt that his name *lepida* applies to the species later described by Macquart as *Rutilia fulgida*. The latter name has not been in use for any species of *Rutilia* (and was never, for instance, mentioned by Malloch in his various papers on Rutiliini), and no disruption of nomenclature arises from fixing the specimen here cited as neotype of *lepida* and sinking Macquart's name *fulgida* in new synonymy (see p. 73). The lectotype of *fulgida* Macquart (designated by Crosskey, 1971) is in the British Museum

(Natural History), and has been directly compared with the specimen chosen as neotype of *lepida*; the two primary types are undoubtedly conspecific. *Rutilia lepida* occurs in south-eastern Australia from northern New South Wales to Victoria, and the neotype chosen (from near Canberra) is from a fairly central position in the normal range.

***Rutilia pellucens*** Macquart, 1846 : 305 (177).

NEOTYPE ♂. AUSTRALIA, New South Wales, Durras Bay, 15-30.x.1953 (F. M. Hull) (in British Museum (Natural History), London).

This species was described from a single specimen (holotype) that stood in Fairmaire's collection. Crosskey (1971) considered the type lost, as no Diptera from Fairmaire's collection have been located; however, the identity of *pellucens* is clear from the five specimens of the species in the British Museum (Natural History) collection that were identified by Macquart himself. The existence of several species of *Rutilia* which are extremely similar to *pellucens* and easily confused with it, makes neotype fixation desirable: as there is no data on the specimens identified by Macquart, other than that they came from Australia, a recently collected specimen with full data has been chosen as neotype after direct comparison with the specimens seen by Macquart.

***Rutilia regalis*** Guérin-Méneville, 1831 : plate 21, fig 1.

NEOTYPE ♂. AUSTRALIA, Australian Capital Territory, Tharwa, 14.ii.1951 (S. J. Paramonov) (in Australian National Insect Collection, Canberra).

Guérin-Méneville's excellent coloured plate of this species (published in 1831, earlier than the text description 1838) shows a large rather uniformly green *Rutilia*, and has enabled later workers to recognize *regalis* correctly. Specimens of *R. regalis* vary slightly in the intensity and shade of green colouring; the original plate figure shows a specimen that is rather golden-green, and the specimen chosen as neotype has a slight golden tinge. The range of the species is mainly from New South Wales to South Australia.

***Rutilia setosa*** Macquart, 1847 : 94 (78)

NEOTYPE ♂. AUSTRALIA, New South Wales, 4 miles North of Bateman's Bay, 20.x.1953 (S. J. Paramonov) (in Australian National Insect Collection, Canberra).

Crosskey (1971) showed that the type of this species is lost. It was originally described from specimens in Bigot's collection said to be from Tasmania (though there is much uncertainty about the exact origins of the Australian specimens in Bigot's collection). Macquart's description of a brown *Rutilia* in which the abdomen has the 'deuxième segment muni de huit à douze soies au bord postérieur' (i.e. T3 with a transverse row of 8-12 median marginal setae in modern terminology) can only relate to a species of *Rutilia* s. str. close to *vivipara* (Fab.); however it is clearly not *vivipara* itself, which has entirely reddish yellow legs, because Macquart records 'pedibus nigris; tibiis testaceis'. In New South Wales there occurs a species close to *vivipara* but having the femora and tarsi largely blackish and contrasting with the reddish yellow tibiae, and it is to this species (until now unnamed) that Macquart's name *setosa* is considered to apply, and from which the neotype here chosen is designated. *Rutilia setosa* Macquart differs from *R. vivipara* (Fabricius) by having the suprasquamal ridge bare, as well as in the leg coloration mentioned.

***Tachina vivipara*** Fabricius, 1805 : 309.

NEOTYPE ♂. AUSTRALIA, New South Wales, Barrington Tops, 9.iv.1949 (S. J. Paramonov) (in Australian National Insect Collection, Canberra).

The provenance of Fabricius' material has always been assumed to be Australia, though the locality was cited as 'Insulis maris pacifici' in the original description; Fabricius' description fits so well with the common eastern Australian *Rutilia* species that has always been accepted as *vivipara* that there is really no doubt about the true identity, and a specimen from New South Wales fitting with both the past concept of *vivipara* and with Fabricius' description is here designated as neotype. As *vivipara* is type-species of *Rutilia*, this neotype is the nomenclatorial

pivot of the Rutiliini. For further information on *vivipara* see under the discussion of *Rutilia sensu stricto* (p. 77).

SUMMARY OF THE PROPOSED CLASSIFICATION OF THE RUTILIINI

The following synoptic catalogue shows all the genus-group and species-group taxa of Rutiliini, together with their synonyms, arranged in accordance with the classification of the tribe here proposed. Names that are considered taxonomically and nomenclaturally valid are printed in bold-face type, synonyms are indented, and misidentifications are indicated by brackets around the misapplied names; only the most important misidentifications are noted. Specific names are alphabetical within their higher taxon.

Family **TACHINIDAE** Robineau-Desvoidy, 1830

Subfamily **PROSENINAE** (Townsend, 1892<sup>4</sup>)

Tribe **RUTILIINI** Brauer & Bergenstamm, 1889

Genus **FORMOSIA** Guérin-Méneville, 1843

Subgenus **FORMOSIA** Guérin-Méneville,  
1843 s. str.

*PANCALA* Enderlein, 1936  
**syn. n.**

*viridiventris*-group

*viridiventris* Crosskey **sp. n.**

*mirabilis*-group

*blattina* (Enderlein, 1936) **comb. n.**

*bracteata* (Enderlein, 1936) **comb. n.**

*callipygos* Gerstaecker, 1860

*eos* (Enderlein, 1936) **comb. n.**

*fervens* (Walker, 1861)

*flavipennis* (Macquart, 1848)

*gemmata* (Enderlein, 1936) **comb. n.**

*viridescens* (Enderlein, 1936)

*glorificans* (Walker, 1861)

*pectoralis* (Walker, 1865) **syn. n.**

*fulvipes* (Enderlein, 1936)

*heinrichiana* (Enderlein, 1936)  
**comb. n.**

*heinrothi* (Enderlein, 1936) **comb. n.**

*mirabilis* (Guérin-Méneville, 1831)

*plumicornis* (Macquart, 1843)

*solomonicola* Baranov, 1936 **stat. n.**

Subgenus **PSEUDIFORMOSIA** Brauer  
& Bergenstamm, 1889

*LACCURA* Enderlein, 1936  
**syn. n.**

*excelsa* (Walker, 1862) **comb. n.**

*moneta* Gerstaecker, 1860

*lucigena* (Walker, 1861) **syn. n.**

*obscuripennis* Brauer & Bergenstamm, 1889 (unavailable)

*pauper* (de Meijere, 1904) **comb. n.**

*saturatissima* (Walker, 1861)

Subgenus **EUAMPHIBOLIA** Townsend,  
1916

*HEGA* Enderlein, 1936 **syn. n.**

*CHROMOCHARIS* Enderlein, 1936 **syn. n.**

*atribasis* (Walker, 1861)

*complicita* (Walker, 1861) **comb. n.**

*pretiosa* (Snellen van Vollenhoven, 1863) **syn. n.**

*sapphirina* (Walker, 1862)  
**syn. n.**

*smaragdifera* Bigot, 1874 **syn. n.**

*viridicingens* (Enderlein, 1936)  
**syn. n.**

*engeli* (Enderlein, 1936) **comb. n.**

*faceta* (Enderlein, 1936) **comb. n.**

*fusca* Crosskey **sp. n.**

<sup>4</sup> See the Introduction for a note on the nomenclatural position of this name.



*smaragdina* Malloch, 1929  
*speciosa* (Erichson, 1842)  
*fulvipes* (Guérin-Méneville,  
 1843)

Genus **FORMODEXIA** gen. n.  
*volucelloides* (Walker, 1861) **comb. n.**  
*ignobilis* (Walker, 1864) **syn. n.**  
*trixoides* (Walker, 1861) **syn. n.**

Genus **RUTILODEXIA** Townsend, 1915  
*BOTHROSTIRA* Enderlein, 1936 **syn. n.**  
*RUTIOSIA* Paramonov, 1968 (un-  
 available)  
*angustipennis* (Walker, 1859)  
*papua* (Bigot, 1880) **comb. n.**  
*prisca* (Enderlein, 1936) **comb. n.**  
*ralumensis* (Enderlein, 1936)  
**syn. n.**

Genus **RUTILIA** Robineau-Desvoidy, 1830

Subgenus **NEORUTILIA** Malloch, 1936  
*simplex* Malloch, 1936

Subgenus **AMENIAMIMA** subgen. n.  
*argentifera* Bigot, 1874  
*frontosa* (Malloch, 1929) **syn.**  
**n.**  
*cingulata* (Malloch, 1930)  
*quadripunctata* (Malloch, 1930)  
**comb. n.**

Subgenus **CHRYSORUTILIA** Townsend,  
 1915 **stat. n.**  
*PHILIPPOFORMOSIA*  
 Townsend, 1927 **syn. n.**  
*HABROTA* Enderlein, 1936  
*ZORAMSCEUS* Enderlein,  
 1936 **syn. n.**  
*IDANIA* Enderlein, 1936  
**syn. n.**  
*FORMOTILIA* Paramonov,  
 1968 (unavailable)

**atrox**-group  
*atrox* (Enderlein, 1936) **comb. n.**

**luzona**-group  
*luzona* (Enderlein, 1936) **comb. n.**  
*townsendi* **nom. n.**  
*splendida* (Townsend, 1927)  
 (preoccupied)

**formosa**-group

*caeruleata* (Enderlein, 1936) **comb. n.**  
*lineata* (Enderlein, 1936)  
**syn. n.**

*caesia* (Enderlein, 1936) **comb. n.**  
*rufibarbis* (Enderlein, 1936)  
**syn. n.**

*viridescens* (Enderlein, 1936)

*chersipho* (Walker, 1849)  
*erichsonii* Engel, 1925 **syn. n.**

*corona* Curran, 1930  
*cryptica* Crosskey **sp. n.**

*decora* Guérin-Méneville, 1843  
*formosa* Robineau-Desvoidy, 1830  
*pubicollis* Thomson, 1869  
**syn. n.**

*subvittata* Malloch, 1929

*uzita* (Walker, 1849) **syn. n.**

*goerlingiana* (Enderlein, 1936)  
**comb. n.**

*idea* (Walker, 1849)

*imperialis* Guérin-Méneville, 1843  
*ruficornis* Bigot, 1880 **syn. n.**  
*semifulva* Bigot, 1880 **syn. n.**

*imperialoides* Crosskey **sp. n.**  
*nana* (Enderlein, 1936) **comb. n.**

*panthea* (Walker, 1849)

*rubriceps* Macquart, 1847  
*angustigena* (Enderlein, 1936)  
**syn. n.**

*formosina* Curran, 1930 **syn. n.**

*nitens* Macquart, 1851 **syn. n.**

*serena* (Walker, 1849) **syn. n.**

*splendida* (Donovan, 1805)

*australasia* Gray, 1832

*confluens* (Enderlein, 1936)

*evanescens* (Enderlein, 1936)

*transversa* Malloch, 1936

Subgenus **DONOVANIUS** Enderlein,  
 1936 **stat. n.**  
*PSARONIA* Enderlein, 1936  
**syn. n.**

*MENEVILLEA* Enderlein,  
 1936 **syn. n.**

*agalmiodes* (Enderlein, 1936)  
**comb. n.**

*analoga* Macquart, 1851  
*dubitata* Malloch, 1929 **syn. n.**

*bisetosa* (Enderlein, 1936) **comb. n.**  
*nigribasis* (Enderlein, 1936)  
**syn. n.**

*brunneipennis* Crosskey **sp. n.**

*ethoda* (Walker, 1849)

- inusta* (Wiedemann, 1830)  
*castanifrons* Bigot, 1880 **syn. n.**  
*castanipes* Bigot, 1880 **syn. n.**  
*potina* (Walker, 1849) **syn. n.**  
*spinipectus* Thomson, 1869  
**syn. n.**
- lepida* Guérin-Méneville, 1843  
*fulgida* Macquart, 1846 **syn. n.**  
*onoba* (Walker, 1849) **syn. n.**
- nigrihirta* Malloch, 1935
- pellucens* Macquart, 1846  
*imitator* (Enderlein, 1936)  
**syn. n.**
- regalis* Guérin-Méneville, 1831  
*nigra* Macquart, 1846 **nomen nudum**
- retusa* (Fabricius, 1775)  
*aditha* (Walker, 1849) **syn. n.**  
*viriditestacea* Macquart, 1851  
**syn. n.**
- sabrata* (Walker, 1849)  
 [inornata G.-M. sensu auct. (misident.)]
- savaliensis* Malloch, 1935
- spinolae* Rondani, 1864
- transfuga* Bezzi, 1928
- viridinigra* Macquart, 1846  
*barcha* (Walker, 1849) **syn. n.**  
*fuscotestacea* Macquart, 1846  
**syn. n.**

Subgenus **RUTILIA** Robineau-Desvoidy, 1830 **s. str.**

- PSARONIELLA* Enderlein, 1936 **syn. n.**  
*STIRAUFLAX* Enderlein, 1936

- confusa* (Malloch, 1929)
- dentata* Crosskey **sp. n.**
- setosa* Macquart, 1847  
 [castanipes Bigot sensu Enderlein (misident.)]
- vivipara* (Fabricius, 1805)  
*desvoidyi* Guérin-Méneville, 1843 **syn. n.**  
*durvillei* Robineau-Desvoidy, 1830 **syn. n.**  
*inornata* Guérin-Méneville, 1843, **syn. n.**

Subgenus **GRAPHOLOSTYLUM** Macquart, 1851 **stat. n.**

- AGALMIA* Enderlein, 1936  
**syn. n.**

- albovirida* Malloch, 1929
- dorsomaculata* (Macquart, 1851)  
*albopicta* Thomson, 1869  
**syn. n.**  
*fuscisquama* Malloch, 1930  
**syn. n.**  
*leucosticta* Schiner, 1868  
**syn. n.**  
*variegata* Bigot, 1874 **syn. n.**
- micans* Malloch, 1929
- subtustomentosa* Macquart, 1851  
*velutina* Bigot, 1874 **syn. n.**

Subgenus **MICRORUTILIA** Townsend, 1915

*PROSENOTOMA* Townsend, 1932 **syn. n.**

*EUCOMPSA* Enderlein, 1936  
*POGONAGALMIA*

Enderlein, 1936, **syn. n.**

*cupreiventris* Malloch, 1936 **stat. n.**  
*fulviventris* Bigot, 1874

*flavipes* (Brauer & Bergenstamm, 1889) **syn. n.**

*hirticeps* Malloch, 1929

*pallens* Curran, 1930 **syn. n.**

[*flavipes* B. & B. sensu Townsend (misident.)]

*liris* (Walker, 1849)

*media* Macquart, 1846

*ruficornis* (Macquart, 1851)  
**syn. n.**

*minor* Macquart, 1846

*nigriceps* Malloch, 1929

*nigripes* (Enderlein, 1936) **comb. n.**

Subgenerically unplaced species-group taxa

*micropalpis* Malloch, 1929

*scutellata* (Enderlein, 1936) (variety)

Genus **AMPHIBOLIA** Macquart, 1843

Subgenus **AMPHIBOLIA** Macquart, 1843  
**s. str.**

*albocincta* (Malloch, 1930)

*campbelli* Paramonov, 1950

*communis* Paramonov, 1968

*ignorata* Paramonov, 1950

*papuana* Crosskey **sp. n.**

*valentina* Macquart, 1843

*vidua* (Guérin-Méneville, 1843)

*wilsoni* Paramonov, 1950

Subgenus **PARAMPHIBOLIA** Brauer & Bergenstamm, 1891 **stat. n.**

- CHAETOGASTRINA* Malloch, 1929 **syn. n.**  
*assimilis* (Macquart, 1851) **comb. n.**  
*stolida* (Malloch, 1929) **comb. n.**
- Genus *CHRY SOPASTA* Brauer & Bergenstamm, 1889  
*ROEDERIA* Brauer & Bergenstamm, 1893  
*ECHRY SOPASTA* Townsend, 1932  
*elegans* (Macquart, 1846)  
*versicolor* Brauer & Bergenstamm, 1889  
*zabirna* (Walker, 1849)
- Genus *PRODIAPHANIA* Townsend, 1927  
*DIAPHANIA* Macquart, 1843 (pre-occupied)  
 [*SENOSTOMA* sensu auct., not Macquart]  
*arida* Paramonov, 1968  
*biarmata* (Malloch, 1936)  
*brevitarsis* Paramonov, 1968  
*claripennis* Malloch, 1929  
*commoni* Paramonov, 1968  
*cygnus* (Malloch, 1936)  
*deserta* Paramonov, 1968  
*echinomides* (Bigot, 1874)  
*fullerae* Paramonov, 1968  
*funnebris* Paramonov, 1968  
*furcata* (Malloch, 1936)  
*genitalis* Paramonov, 1968  
*paratestacea* Paramonov, 1968  
**syn. n.**
- georgei* Malloch, 1929  
*minuta* Paramonov, 1968  
*regina* (Malloch, 1936)  
*testacea* (Macquart, 1843)  
*victoriae* (Malloch, 1936)  
*vittata* (Macquart, 1855)  
*walkeri* Paramonov, 1968
- Genus *CHETOGASTER* Macquart, 1851  
*CODIUM* Enderlein, 1936  
*CHAETOGASTER*: incorrect subsequent spelling  
*argentifera* Malloch, 1936  
*auriceps* Paramonov, 1968  
*canberrae* Paramonov, 1954  
*oblonga* (Macquart, 1847)  
*gratiosa* Paramonov, 1954  
**syn. n.**  
*pellucida* Paramonov, 1954  
*violacea* Macquart, 1851  
*viridis* Malloch, 1936
- Nomina nuda (unplaceable)
- Diaphania grisea* Brauer & Bergenstamm, 1891  
*Formosia viridithorax* Bigot, 1874  
*Rutilia accedens* Brauer & Bergenstamm, 1891  
*Rutilia erronea* Paramonov, 1968  
*Rutilia humeralis* Paramonov, 1968  
*Rutilia incomparabilis* Brauer & Bergenstamm, 1891  
*Rutilia soror* Brauer & Bergenstamm, 1891

#### INDEX-CATALOGUE OF SPECIES-GROUP NAMES AND THEIR TYPES

The index-catalogue given below provides a complete alphabetical list of the species-group names of Rutiliini, with a summary of essential information on each primary type. Each species-group name is cited in the original spelling and is accompanied by the following information:

Author; date and page reference of original publication; genus of original assignment (in parentheses); status and sex of primary type; authority for lectotype designation (if relevant); data of primary type (when available in the sequence: locality, altitude, date of collection, name of collector in italics); type-depository.

Any special annotations, such as explanatory notes on the nomenclatural status or dating of names, are given after the basic type information (unless the name is unavailable and therefore has no type). Nomenclaturally available names are printed in bold type and *nomina nuda* and other unavailable names are printed in



non-bold italics. (Surprisingly, there are no instances of primary homonymy in the Rutiliini.)

A few entries have been enclosed in square brackets and the names printed in non-bold italics; this indicates, for convenience, those few species that were described in Rutiliine genera but which are considered not to belong in the Rutiliini.

The following abbreviations have been used for the museum collections in which the primary types are housed:

AM	Australian Museum, Sydney
AMNH	American Museum of Natural History, New York
ANIC	Australian National Insect Collection, Canberra
BMNH	British Museum (Natural History), London
IRSNB	Institut Royal des Sciences Naturelles de Belgique, Brussels
MHN	Musée d'Histoire Naturelle, Lille
MNHN	Muséum National d'Histoire Naturelle, Paris
MNHU	Museum für Naturkunde der Humboldt-Universität, Berlin
NM	Naturhistorisches Museum, Vienna
NMV	National Museum of Victoria, Melbourne
NR	Naturhistoriska Riksmuseum, Stockholm
RMNH	Rijksmuseum van Natuurlijke Historie, Leiden
SPHTM	School of Public Health and Tropical Medicine, Sydney
USNM	United States National Museum, Washington D.C.

Full bibliographic references to the works containing the original descriptions of the species-group taxa, or to the original use of a name if there is no description, can be found in the 'References' section on p. 140.

- accedens* Brauer & Bergenstamm, 1891 : 418 (114) (*Rutilia*). *Nomen nudum* (no later validation).
- aditha*** Walker, 1849 : 854 (*Dexia*). Holotype ♂, AUSTRALIA (Western Australia, Swan River) : BMNH, London.
- agalmiodes*** Enderlein, 1936 : 412 (*Donovanius*). Holotype ♂, AUSTRALIA (Queensland, Cairns, 1907) : MNHU, Berlin.
- agalmiodes* Enderlein, 1936 : 434 (*Prosenostoma*, as aberration of *ruficorne* Macquart, 1851) Infrasubspecific name without status in nomenclature.
- albocincta*** Malloch, 1930 : 108 (*Rutilia*). Holotype ♀, AUSTRALIA (New South Wales, Barrington Tops, ii.1925, *S.U. Zool. Exp.*) : ANIC, Canberra.
- albopicta*** Thomson, 1869 : 529 (*Rutilia*). Holotype ♀, AUSTRALIA (New South Wales, Sydney, *Kinb.*) : NR, Stockholm.
- albovirida*** Malloch, 1929 : 307 (*Rutilia* (*Senostoma*)). Holotype ♀, AUSTRALIA (Queensland, Yeppoon, x.1924, *A. Musgrave*) : AM, Sydney.
- analoga*** Macquart, 1851 : 191 (218) (*Rutilia*). Holotype ♀ [publ. as ♂], AUSTRALIA (? New South Wales [publ. as 'Tasmanie']) : MNHN, Paris.
- [*angustecarinata* Macquart, 1848 : 211 (51) (*Rutilia*). Not Rutiliini. ♂ holotype discovered in 1971 in the remnants of Payen's collection, formerly in the Municipal Museum at Tournai and now in IRSNB, Brussels, shows that this nominal species is not a Rutiliine but belongs in the Tachinid tribe Nemoraeni.]
- angustigena*** Enderlein, 1936 : 403 (*Chrysorutilia*). Lectotype ♂, by present designation (p. 117), AUSTRALIA (Queensland, Herberton, i.1910) : MNHU, Berlin.

- angustipennis** Walker, 1859 : 101 (*Rutilia*). Holotype ♂, INDONESIA (Aru Islands, *A. R. Wallace*) : BMNH, London.
- argentifera** Bigot, 1874 : 464 (*Rutilia*). Lectotype ♂, by designation of Crosskey (1971 : 300), AUSTRALIA (New South Wales, Sydney) : BMNH, London.
- argentifera** Malloch, 1936 : 19 (*Chaetogaster*). Holotype ♀, AUSTRALIA (Victoria, Gisborne, 25.ii.1923, *G. Lyell*) : SPHTM, Sydney.
- arida** Paramonov, 1968 : 397 (*Prodiaphania*). Holotype ♂, AUSTRALIA (Victoria, Little Desert, 5 miles S. of Kiata, 13.ii.1956, *I. F. B. Common*) : ANIC, Canberra.
- assimilis** Macquart, 1851 : 192 (219) (*Rutilia*). Lectotype ♂, by designation of Crosskey (1971 : 285), AUSTRALIA (Tasmania) : MNHN, Paris.
- Macquart cited the type-locality as 'Nouvelle-Hollande: côte orientale' in the original description, but Crosskey (1970) established, from accession reference numbers on the type-material, that Tasmania is the correct provenance.
- atribasis** Walker, 1861b : 288 (*Rutilia*). Lectotype ♀, by present designation (p. 119), INDONESIA (Moluccas, Batjan, *A. R. Wallace*) : BMNH, London.
- atrox** Enderlein, 1936 : 408 (*Idania*). Holotype ♀, PHILIPPINE REPUBLIC (Luzon, Imugan, 6.vi.1918, *Georg Böttcher*) : MNHU, Berlin.
- auriceps** Paramonov, 1968 : 371 (*Chaetogaster*). Holotype ♀, AUSTRALIA (Queensland, Collinsville, 15.ix.1950, *E. F. Riek*) : ANIC, Canberra.
- australasia** Gray in Cuvier, 1832 : pl. 114, fig. 1 & p. 793 [index] (*Rutilia*). Holotype or syntypes [♀], AUSTRALIA : lost.
- The description of this nominal species consists of a good figure by Gray clearly showing a ♀ *Rutilia*, and of the words 'Black and blue' appearing in the index on p. 793 of the second *Insecta* volume of Cuvier's *The Animal Kingdom*. No specimen or specimens that could have formed the basis for Gray's figure have been located, and the type-material is therefore presumed lost. Walker (1849 : 863) synonymized the name *R. australasia* Gray with *R. splendida* (Donovan); this synonymy, which is fully justified by Gray's excellent figure, is here upheld as certainly correct.
- barcha** Walker, 1849 : 857 (*Dexia*). Holotype ♀, AUSTRALIA : BMNH, London.
- biarmata** Malloch, 1936 : 14 (*Senostoma*). Holotype ♂, AUSTRALIA (South Australia, *J. B. Cleland*) : SPHTM, Sydney.
- bisetosa** Enderlein, 1936 : 414 (*Psaronia*). Lectotype ♀, by present designation (p. 119), AUSTRALIA (Western Australia, Wurarga, Marloo Station, 1935, *Goerling*) : MNHU, Berlin.
- blattina** Enderlein, 1936 : 423 (*Pancala*). Holotype ♀, INDONESIA (Celebes, Latimodjong Mts, 1300-1500 m, vii.1930, *G. Heinrich*) : MNHU, Berlin.
- bracteata** Enderlein, 1936 : 425 (*Pancala*). Holotype ♂, PAPUA NEW GUINEA (southern New Ireland ['Süd-Neu-Mecklenburg'], exped. *Friederici*) : MNHU, Berlin.
- brevitarsis** Paramonov, 1968 : 395 (*Prodiaphania*). Holotype ♂, AUSTRALIA (New South Wales, near Queanbeyan, 10.iii.1953, *S. J. Paramonov*) : ANIC, Canberra.
- brunneipennis** Crosskey, 1972 : (present paper) (*Rutilia* (*Donovanius*)). Holotype ♀, SOLOMON ISLANDS (Guadalcanal, Suta, 27.vi.1956, *E. S. Brown*) : BMNH, London.
- caeruleata** Enderlein, 1936 : 402 (*Chrysorutilia*). Lectotype ♂, by present designation (p. 117), AUSTRALIA (Western Australia, Wurarga, Marloo station, ix.1935, *A. Goerling*) : MNHU, Berlin.
- caesia** Enderlein, 1936 : 402 (*Chrysorutilia*). Lectotype ♂, by present designation (p. 117), AUSTRALIA (*Clement*) : MNHU, Berlin.
- callipygos** Gerstaecker, 1860 : 198 (*Formosia*). Holotype ♀ NEW GUINEA (*Felder*) : MNHU, Berlin.
- campbelli** Paramonov, 1950 : 523 (*Amphibolia*). Holotype ♂, AUSTRALIA (Australian Capital Territory, Blundell's near Canberra, 23.xi.1938, *T. G. Campbell*) : ANIC, Canberra.
- canberrae** Paramonov, 1954 : 277 (*Chaetogaster*). Holotype ♂, AUSTRALIA (Australian Capital Territory, Canberra, Black Mt, 30.xii.1929, *G. A. Currie*) : ANIC, Canberra.
- castanifrons** Bigot, 1880 : 88 (*Rutilia*). Holotype ♀, AUSTRALIA : BMNH, London.

- castanipes* Bigot, 1880 : 87 (*Rutilia*). Lectotype ♀, by designation of Crosskey (1971 : 300), AUSTRALIA : BMNH, London.
- chersipho* Walker, 1849 : 864 (*Dexia*). Neotype ♂, by present designation (p. 123), AUSTRALIA (Western Australia, Waroona, 21.xi.1908, *G. F. Berthoud*) : BMNH, London.
- cingulata* Malloch, 1930 : 105 (*Formosia*). Holotype ♂, AUSTRALIA (New South Wales, Wentworth Falls, 14.xii.1923, *Harrison*) : ANIC, Canberra.
- claripennis* Malloch, 1929 : 292 (*Prodiaphania*, as variety of *testacea* Macquart, 1843). Holotype ♂, AUSTRALIA (Western Australia, King George's Sound) : AM, Sydney.
- communi* Paramonov, 1968 : 363 (*Amphibolia*). Holotype ♀, AUSTRALIA (Victoria, Grampians, Fyan's Creek, 11.ii.1956, *I. F. B. Common*) : ANIC, Canberra.
- communi* Paramonov, 1968 : 389 (*Prodiaphania*). Holotype ♂, AUSTRALIA (Victoria, Little Desert, 5 m. S. of Kiata, *I. F. B. Common*) : ANIC, Canberra.
- complicita* Walker, 1861b : 288 (*Rutilia*). Holotype ♂ [not ♀], INDONESIA (Moluccas, Batjan, *A. R. Wallace*) : BMNH, London.
- confluens* Enderlein, 1936 : 407 (*Chrysorutilia*, as variety of *splendida* Donovan, 1805) Lectotype ♂, by present designation (p. 118), AUSTRALIA (Queensland) : MNHU, Berlin.
- confusa* Malloch, 1929 : 309 (*Formosia*). Holotype ♂, AUSTRALIA (South Australia, Kangaroo Island, deep creek 20 m. from Kingscote, *E. Troughton*) : AM, Sydney.
- corona* Curran, 1930 : 3 (*Rutilia*). Holotype ♂, AUSTRALIA (New South Wales, *H. Edwards*) : AMNH, New York.
- cryptica* Crosskey, 1972 : (present paper) (*Rutilia (Chrysorutilia)*). AUSTRALIA (South Australia, near Moonta, 16.xi.1904, *W. Wesche*) : BMNH, London.
- cupreiventris* Malloch, 1936 : 18 (*Rutilia (Microrutilia)* as variety of *ruficornis* Macquart, 1851). Holotype ♂, AUSTRALIA (New South Wales, Barrington Tops, ii.1925, *S.U. Zool. Exp.*) : SPHTM, Sydney.
- cygnus* Malloch, 1936 : 15 (*Senostoma*). Holotype ♂, AUSTRALIA (Western Australia, Swan River, *L. J. Newman*) : SPHTM, Sydney.
- decora* Guérin-Méneville, 1843 : 266 (*Rutilia*). Neotype ♂, by present designation (p. 124), AUSTRALIA (Queensland, Burpengary, *T. L. Bancroft*) : BMNH, London.
- dentata* Crosskey, 1972 : (present paper) (*Rutilia (Rutilia)*). Holotype ♂, AUSTRALIA (Victoria, Monbulk) : BMNH, London.
- deserta* Paramonov, 1968 : 398 (*Prodiaphania*). Holotype ♂, AUSTRALIA (New South Wales, Wanaaring, 29.x.1949, *S. J. Paramonov*) : ANIC, Canberra.
- desvoidyi* Guérin-Méneville, 1843 : 269 (*Rutilia*). Lectotype ♀, by present designation (p. 119), AUSTRALIA : MNHN, Paris.
- [*diversa* Paramonov, 1954 : 280 (*Chaetogaster*). Not Rutiliini as herein defined.]
- dorsomaculatum* Macquart, 1851 : 196 (223) (*Grapholostylum*). Lectotype ♂, by designation of Crosskey (1971 : 271), AUSTRALIA ('Tasmanie', probably error for New South Wales) : MNHN, Paris.
- [*dubia* Macquart, 1846 : 311 (183) (*Rutilia*). Not Tachinidae, see Crosskey (1971 : 285).]
- dubitata* Malloch, 1929 : 303 (*Rutilia*). Holotype ♀, AUSTRALIA (New South Wales, Jindabyne, iii.1889, *Helms*) : AM, Sydney.
- durvillei* Robineau-Desvoidy, 1830 : 321 (*Rutilia*). Neotype ♂, by present designation (p. 124), AUSTRALIA (New South Wales, Hawkesbury River, 28.xi.1914) : BMNH, London.
- echinomides* Bigot, 1874 : 466 (*Rutilia*). Holotype ♀, AUSTRALIA : BMNH, London.
- elegans* Macquart, 1846 : 309 (181) (*Rutilia*). Holotype ♂, AUSTRALIA (New South Wales, Sydney) : BMNH, London.
- engeli* Enderlein, 1936 : 431 (*Laccura*). Lectotype ♀, by present designation (p. 118), INDONESIA (Banda Islands, Run [=Roon] Island, south of Ceram) : MNHU, Berlin.
- eos* Enderlein, 1936 : 423 (*Pancala*). Lectotype ♂, by present designation (p. 118), INDONESIA (Celebes, Bonthain, Wawa Karaeng, 1100 m., viii.1931, *G. Heinrich*) : MNHU, Berlin.
- erichsonii* Brauer & Bergenstamm, 1891 : 418 (114) (*Rutilia*). *Nomen nudum* (later validated as *erichsonii* Engel, q.v.).
- erichsonii* Engel, 1925 : 363 (*Rutilia*). Lectotype ♀, by fixation of Malloch (1929 : 297),



AUSTRALIA (Western Australia, Swan River) : NM, Vienna.

*erronea* Paramonov, 1968 : 356, 361 (*Rutilia*). *Nomen nudum*.

This name was published in Paramonov's (1968) posthumous paper on Rutiliini in the discussion of the genus *Amphibolia* Macquart and in the preamble to the description there given of *A. albocincta* (Malloch); there is no definition of the taxon, and the name *erronea* is unavailable (*nomen nudum*).

*ethoda* Walker, 1849 : 856 (*Dexia*). Holotype ♀, AUSTRALIA (Western Australia, Swan River) : BMNH, London.

*evanescens* Enderlein, 1936 : 407 (*Chrysorutilia*, as variety of *splendida* Donovan, 1805). Holotype ♂, AUSTRALIA (*Damel*) : MNHU, Berlin.

The holotype bears a label reading 'N. Holl/sept. Damel' and Enderlein (1936 : 407) interpreted this as northern Australia ('Nord-Australien'); this seems doubtful, and the provenance within Australia is here considered unknown.

*excelsa* Walker, 1862 : 19 (*Rutilia*). Holotype ♂, INDONESIA (Moluccas, Ternate, *A. R. Wallace*) : BMNH, London.

*faceta* Enderlein, 1936 : 422 (*Hega*). Holotype ♂, AUSTRALIA (N. Queensland) : MNHU, Berlin

*fervens* Walker, 1861 : 288 (*Rutilia*). Holotype ♀, INDONESIA (Moluccas, Batjan, *A. R. Wallace*) : BMNH, London.

*flavipennis* Macquart, 1848 : 210 (50) (*Rutilia*). Holotype ♂, JAVA (*Payen*) : IRSNB Brussels (ex Municipal Mus., Tournai).

Crosskey (1971 : 286) could not locate the original material of this species during work on Macquart's types, but the ♂ holotype was located during the present work in the remnants of Payen's collection (now in Brussels) from the Municipal Museum, Tournai. It consists of the eaten out shell of head and thorax and abdominal venter, but all legs and genitalia are present and the identity is clear; the body is discoloured.

*flavipes* Brauer & Bergenstamm, 1889 : 126 (58) (*Senostoma*). Lectotype ♀, by present designation (p. 121), AUSTRALIA ('New Holland') : NM, Vienna.

*formosa* Robineau-Desvoidy, 1830 : 320 (*Rutilia*). Neotype ♂, by present designation (p. 124) AUSTRALIA (New South Wales, near Lake George, 25.xi.1953, *S. J. Paramonov*) : ANIC, Canberra.

*formosina* Curran, 1930 : 2 (*Rutilia*). Holotype ♂, AUSTRALIA : AMNH, New York.

*frontosa* Brauer & Bergenstamm, 1891 : 418 (114) (*Rutilia*). *Nomen nudum* (later validated as *frontosa* Malloch, q.v.).

*frontosa* Malloch, 1929 : 310 (*Formosia*). Holotype ♂, AUSTRALIA (New South Wales, Jindabyne, 3000 ft, iii.1889, *Helms*) : AM, Sydney.

*fu'gida* Macquart, 1846 : 308 (180) (*Rutilia*). Lectotype ♂, by designation of Crosskey (1971 : 286), AUSTRALIA (New South Wales, Sydney) : BMNH, London.

*fullerae* Paramonov, 1968 : 393 (*Prodiaphania*). Holotype ♂, AUSTRALIA (New South Wales, Barrington Tops, 29-30.xii.1934, *M. E. Fuller*) : ANIC, Canberra

*fulvipes* Enderlein, 1936 : 426 (*Pancala*, as variety of *glorificans* Walker, 1861) Holotype ♀, PAPUA NEW GUINEA (Milne Bay, *Micholitz*) : MNHU, Berlin.

*fulvipes* Guérin-Méneville, 1843 : 273 (*Rutilia*). Holotype ♀, AUSTRALIA : lost.

*fulviventris* Bigot, 1874 : 465 (*Rutilia*). Lectotype ♀, by designation of Crosskey (1971 : 301), AUSTRALIA (Tasmania) : BMNH, London.

*funbris* Paramonov, 1968 : 391 (*Prodiaphania*) Holotype ♂, AUSTRALIA (South Australia, 40 m. S.W. of Iron Knob, 23.x.1958, *I. F. B. Common*) : ANIC, Canberra.

*furcata* Malloch, 1936 : 14 (*Senostoma*). Holotype ♂, AUSTRALIA (Australian Capital Territory Canberra, 16.xii.1928, *M. Fuller*) : ANIC, Canberra.

*fusca* Crosskey, 1972 : (present paper) (*Formosia* (*Euamphibolia*)). Holotype ♂, INDONESIA (Moluccas, Seram, Mansela, 2500 ft, 1919, *Pratt*) : BMNH, London.

*fuscisquama* Malloch, 1930 : 107 (*Rutilia*, as variety of *leucosticta* Schiner, 1868). Holotype ♀, AUSTRALIA (New South Wales, Barrington Tops, Allyn Range, ii.1925, on *Leptospermum*, *S.U. Zool. Exp.*) : ANIC, Canberra.

- fuscotestacea* Macquart, 1846 : 306 (178) (*Rutilia*). Holotype ♀, AUSTRALIA (New South Wales, Sydney) : BMNH, London.
- gemmata* Enderlein, 1936 : 424 (*Pancala*). Lectotype ♂, by present designation (p. 118), PAPUA NEW GUINEA (New Britain, Ralum, Karakaul, 30.viii.1896, in high forest, *F. Dahl*) : MNHU, Berlin.
- genitalis* Paramonov, 1968 : 400 (*Prodiaphania*). Holotype ♂, AUSTRALIA (Queensland, Herberton, ii.1911) : BMNH, London.
- georgei* Malloch, 1929 : 292 (*Prodiaphania*). Holotype ♂, AUSTRALIA (Western Australia, King George's Sound) : AM, Sydney.
- glorificans* Walker, 1861a : 241 (*Rutilia*). Holotype ♂, INDONESIAN NEW GUINEA (Dorey, *A. R. Wallace*) : BMNH, London.
- goerlingiana* Enderlein, 1936 : 404 (*Chryсорutilia*). Lectotype ♀, by present designation (p. 117), AUSTRALIA (Western Australia, Wurarga, Marloo Station, i.1935, *A. Goerling*) : MNHU, Berlin.
- gratiosa* Paramonov, 1954 : 283 (*Chaetogaster*). Holotype ♂, AUSTRALIA (Victoria, Wonnangatta River, Gibraltar Point, 12.xii.1949, *T. G. Campbell*) : ANIC, Canberra.
- grisea* Brauer & Bergenstamm, 1891 : 417 (113) (*Diaphania*). *Nomen nudum* (no later validation).
- heinrichiana* Enderlein, 1936 : 426 (*Pancala*). Holotype ♂, INDONESIA (Celebes, Bonthain, Wawa Karaeng, 1100 m, ix-x.1931 *G. Heinrich*) : MNHU, Berlin.
- heinrothi* Enderlein, 1936 : 425 (*Pancala*). Holotype ♀, PAPUA NEW GUINEA (New Britain, Matupi, xii.1900-v.1901, *Heinroth*) : MNHU, Berlin.
- hirticeps* Malloch, 1929 : 305 (*Rutilia* (*Senostoma*)). Holotype ♂, AUSTRALIA (New South Wales, Monaro, Moonbar, 3000-3500 ft, iii.1889, *Helms*) : AM, Sydney.
- humeralis* Paramonov, 1968 : 355 (*Rutilia*). *Nomen nudum*.
- This name was published in the expression '*Rutilia humeralis* group' in Paramonov's (1968) posthumous paper on Rutiliini in the key to genera (p. 355); there is no definition of the specific taxon and the name is unavailable (*nomen nudum*).
- idesa* Walker, 1849 : 858 (*Dexia*). Holotype ♂ [not ♀], AUSTRALIA : BMNH, London.
- ignobilis* Walker, 1864 : 238 (*Rutilia*). Holotype ♀, INDONESIA (Moluccas, Halmahera, *A. R. Wallace*) : BMNH, London
- Walker, in the original publication, cited the provenance of this nominal species as Gorrite (a locality in Brazil), but the specimen was actually collected by Wallace in the island of Gilolo (=Halmahera) and is so labelled
- ignorata* Paramonov, 1950 : 522 (*Amphibolia*). Holotype ♂, AUSTRALIA (New South Wales Tindery i.i.1938, *Mackerras*) : ANIC, Canberra.
- imitator* Enderlein, 1936 : 412 (*Donovanius*). Holotype ♂, AUSTRALIA (*Behr*) : MNHU, Berlin.
- imperialis* Guérin-Méneville, 1843 : 265 (*Rutilia*). Neotype ♂, by present designation (p. 125), AUSTRALIA (New South Wales, Mt Wilson, 2.i.1953, *M. F. Day*) : ANIC, Canberra.
- imperialoides* Crosskey, 1972 : (present paper) (*Rutilia* (*Chryсорutilia*)). Holotype ♂, AUSTRALIA (New South Wales, Wee Jasper, xii.1920) : BMNH, London.
- incomparabilis* Brauer & Bergenstamm, 1891 : 418 (114) (*Rutilia*). *Nomen nudum* (no later validation).
- inornata* Guérin-Méneville, 1843 : 268 (*Rutilia*). Lectotype ♀, by present designation (p. 119), AUSTRALIA : MNHN, Paris.
- inusta* Wiedemann, 1830 : 306 (*Tachina*). Lectotype ♀, by present designation (p. 121), AUSTRALIA (New South Wales, Sydney ['Port Jackson'], *Eschscholtz*) : MNHU, Berlin.
- lepida* Guérin-Méneville, 1843 : 268 (*Rutilia*). Neotype ♂, by present designation (p. 125), AUSTRALIA (Australian Capital Territory, Blundell's near Canberra, 19.iv.1948, *Paramonov*) : ANIC, Canberra.
- leucosticta* Schiner, 1868 : 319 (*Rutilia*). Holotype ♀, AUSTRALIA : NM, Vienna.
- Schiner, in the original publication, cited the provenance of this species as New Zealand ('Neuseeland'), but the holotype is labelled as from Australia ('New Holland'); the latter

is certainly correct, as the Rutiliini are absent from New Zealand. Engel (1925 : 364) and Malloch (1928 : 659) have correctly noted the Australian provenance.

**lineata** Enderlein, 1936 : 407 (*Chryсорutilia*). Lectotype ♂, by present designation (p. 118), AUSTRALIA (Western Australia, Wurarga, Marloo Station, iv.1935, *A. Goerling*) : MNHU, Berlin.

**liris** Walker, 1849 : 882 (*Musca*). Holotype ♀, AUSTRALIA (? Tasmania) : BMNH, London.

The type-locality of *liris* is unknown, but the species to which the holotype belongs is found in Tasmania, and this is the most probable provenance of the type.

**lucigena** Walker, 1861a : 242 (*Rutilia*). Lectotype ♂, by present designation (p. 120), INDONESIAN NEW GUINEA (Dorey, *A. R. Wallace*) : BMNH, London.

**luzona** Enderlein, 1936 : 406 (*Chryсорutilia*). Holotype ♂, PHILIPPINE REPUBLIC (Luzon, Imugan, 30.vi.1918, *Georg Boettcher*) : MNHU, Berlin.

**media** Macquart, 1846 : 310 (182) (*Rutilia*). Lectotype ♂, by designation of Crosskey (1971 : 286), AUSTRALIA (Tasmania) : MNHN, Paris.

**micans** Malloch, 1929 : 299 (*Rutilia*). Holotype ♀, AUSTRALIA (New South Wales, Kosciusko, 5000 ft, iii.1889, *Helms*) : AM, Sydney.

**micropalpis** Malloch, 1929 : 298 (*Rutilia*). Holotype ♀, AUSTRALIA (New South Wales, Como near Sydney, 7.xi.1923, *J. T. Campbell & A. Musgrave*) : AM, Sydney.

**minor** Macquart, 1846 : 310 (182) (*Rutilia*). Lectotype ♂, by designation of Crosskey (1971 : 286), AUSTRALIA (Tasmania) : MNHN, Paris.

**minuta** Paramonov 1968 : 399 (*Prodiaphania*). Holotype ♂, AUSTRALIA (Queensland, Gordonvale, 1923) : ANIC, Canberra.

**mirabilis** Guérin-Ménéville, 1831 : plate 21, fig. 2 (*Rutilia*); 1838 : 296 (*Musca*). Holotype ♀ (head lost), INDONESIAN NEW GUINEA (Fak-Fak ['Offak']) : MNHN, Paris.

This name is available from publication of the plate figure (as *Rutilia mirabilis*) in 1831, which pre-dated the text description (as *Musca mirabilis*) published in 1838.

**moneta** Gerstaecker, 1860 : 200 (*Formosia*). Holotype ♀, NEW GUINEA (*Felder*) : MNHU, Berlin.

**nana** Enderlein, 1936 : 404 (*Chryсорutilia*). Holotype ♀, INDONESIA (Kai [=Kei] Islands) : MNHU, Berlin.

**nigra** Macquart, 1846 : 305 (177) (*Rutilia*). *Nomen nudum* (no later validation).

Specific named cited without definition of the taxon, but not as a synonym, in the original description of *Rutilia pellucens* Macquart, and unavailable (*nomen nudum*).

**nigribasis** Enderlein, 1936 : 411 (*Donovanius*, as variety of *fulgidus* Macquart, 1846). Lectotype ♂, by present designation (p. 118), AUSTRALIA (Western Australia Wurarga, Marloo Station, 6.vi.1935, *A. Goerling*) : MNHU, Berlin.

**nigriceps** Malloch, 1929 : 306 (*Rutilia* (*Senostoma*)). Holotype ♂, AUSTRALIA (New South Wales, East Dorriggo, Ulong, *W. Heron*) : AM, Sydney.

**nigrihirta** Malloch, 1935 : 349 (*Rutilia* (*Rutilia*)). Holotype ♂, SAMOA (Upolu, Malololelei, 2000 ft, 2.viii.1925, *Buxton & Hopkins*) : BMNH, London.

**nigripes** Enderlein, 1936 : 435 (*Prosenostoma*). Lectotype ♂, by present designation (p. 119), AUSTRALIA (Queensland, Herberton, 3700 ft, ii.1911, *Dodd*) : MNHU, Berlin.

[*nigrithorax* Macquart, 1851 : 190 (217) (*Rutilia*). Not Rutiliini as herein defined.]

**nitens** Macquart, 1851 : 189 (216) (*Rutilia*). Holotype ♀, INDIA : MNHN, Paris.

**oblunga** Macquart, 1847 : 92 (76) (*Rutilia*). Holotype ♂, AUSTRALIA : BMNH, London.

**obscuripennis** Brauer & Bergenstamm, 1889 : 126 (58) (*Formosia*); Brauer & Bergenstamm, 1891 : 434 (130) (*Pseudoformosia*) & 435 (131) (*Formosia*).

Name attributed to Bigot but published by Brauer & Bergenstamm in synonymy with *Pseudoformosia moneta* (Gerstaecker) and unavailable under Article 11 (d) of the *International Code of Zoological Nomenclature*, 1961.

**onoba** Walker, 1849 : 859 (*Dexia*). Holotype ♂, AUSTRALIA : BMNH, London.

**pallens** Curran, 1930 : 2 (*Rutilia*). Holotype ♂, AUSTRALIA (New South Wales) : AMNH, New York.



- panthea** Walker 1849 : 862 (*Dexia*). Holotype ♀ AUSTRALIA (Western Australia) : BMNH, London.
- papua** Bigot, 1880 : 87 (*Formosia*). Lectotype ♀ [not ♂] by designation of Crosskey (1971 : 298), NEW GUINEA (*L. Laglaise*) : BMNH, London.
- papuana** Crosskey, 1972 : (present paper) (*Amphibolia* (*Amphibolia*)). Holotype ♀, NEW GUINEA (Murmur Pass, 8600 ft, x.1961, *W. W. Brandt*) : BMNH, London.
- paratestacea** Paramonov, 1968 : 397 (*Prodiaphania*). Holotype ♂, AUSTRALIA (New South Wales, Wee Jasper, 26.i.1936, *M. Fuller*) : ANIC, Canberra.
- pauper** de Meijere, 1904 : 178 (*Pseudoformosia*). Lectotype ♂, by present designation (p. 119), INDONESIA (Moluccas, N. Halmahera, *Bernstein*) : RMNH, Leiden.
- pectoralis** Walker, 1865 : 114 (*Rutilia*). Holotype ♀, NEW GUINEA (*A. R. Wallace*) : BMNH, London.
- pellucens** Macquart, 1846 : 305 (177) (*Rutilia*). Neotype ♂, by present designation (p. 126), AUSTRALIA (New South Wales, Durras Bay, 15-30.x.1953, *F. M. Hull*) : BMNH, London.
- pellucida** Paramonov, 1954 : 276 (*Chaetogaster*, as variety of *argentifera* Malloch, 1936). Holotype ♂, AUSTRALIA (New South Wales, Toronto) : ANIC, Canberra.
- plumicornis** Macquart, 1843 : 239 (82) (*Rutilia*). INDONESIA NEW GUINEA (Fak-Fak ['Offak']) : type-material lost or possibly represented by the holotype of *Rutilia mirabilis* Guérin-Méneville.
- It is possible that Macquart's name *plumicornis*, which he attributed to Guérin-Méneville in the original description, is based upon one and the same type-specimen as *Rutilia mirabilis* Guérin-Méneville: for further discussion of this possibility see Crosskey (1971 : 289).
- potina** Walker, 1849 : 857 (*Dexia*). Holotype ♀, AUSTRALIA (Tasmania) : BMNH, London.
- pretiosa** Snellen van Vollenhoven, 1863 : 15 (*Rutilia*). Lectotype ♂, by present designation (p. 120), INDONESIA (Moluccas, Ternate, *Bernstein*) : RMNH, Leiden.
- prisca** Enderlein, 1936 : 413 (*Bothrostira*). Holotype ♂, PAPUA NEW GUINEA (New Britain, Kinigunang [publ. as 'Kinikunang'], *C. Ribbe*) : MNHU, Berlin.
- pubicollis** Thomson, 1869 : 530 (*Rutilia*). Lectotype ♂, by present designation (p. 120), AUSTRALIA (New South Wales, Sydney, *Kinb.*) : NR, Stockholm.
- quadripunctata** Malloch, 1930 : 104 (*Formosia*). Holotype ♂, AUSTRALIA (Queensland, Eidsvold, xii.1922, *Mackerras*) : ANIC, Canberra.
- ralumensis** Enderlein, 1936 : 409 (*Idania*). Lectotype ♀, by present designation (p. 118), PAPUA NEW GUINEA (New Britain, Ralum, 30.viii.1896, *F. Dahl*) : MNHU, Berlin.
- regalis** Guérin-Méneville, 1831 : plate 21, fig. 1 (*Rutilia*); 1838 : 295 (*Musca*). Neotype ♂ by present designation (p. 126), AUSTRALIA (Australian Capital Territory, Tharwa 14.ii.1951, *S. J. Paramonov*) : ANIC, Canberra.
- This name is available from publication of the plate figure (as *Rutilia regalis*) in 1831, which pre-dated the text description (as *Musca regalis*) published in 1838.
- regina** Malloch, 1936 : 14 (*Senostoma*). Holotype ♂, AUSTRALIA (Queensland, Eidsvold, xii. 1922) : SPHTM, Sydney.
- retusa** Fabricius, 1775 : 775 (*Musca*). Holotype ♀, AUSTRALIA : BMNH, London (Sir Joseph Banks coll.).
- rubriceps** Macquart, 1847 : 92 (76) (*Rutilia*). Holotype ♀, AUSTRALIA ('Tasmanie', possibly in error) : BMNH, London.
- This species was described from Tasmania, but the true provenance of the holotype is more probably Queensland (Crosskey, 1971 : 289).
- rufibarbis** Enderlein, 1936 : 405 (*Chrysorutilia*). Lectotype ♂, by present designation (p. 118), AUSTRALIA (Western Australia, Wurarga, Marloo Station, ix-x.1934, *A. Goerling*) : MNHU, Berlin.
- ruficornis** Bigot, 1880 : 88 (*Rutilia*). Holotype ♂, AUSTRALIA : BMNH, London.
- This name is a junior secondary homonym in *Rutilia* of *R. ruficornis* (Macquart, 1851); no new name is required as *ruficornis* Bigot is a synonym of *R. imperialis* Guérin-Méneville.

- ruficornis* Macquart, 1851 : 193 (220) (*Diaphania*). Holotype ♂, AUSTRALIA (Tasmania) : MNHN, Paris.
- sabrata* Walker, 1849 : 855 (*Dexia*). Holotype ♀, AUSTRALIA : BMNH, London.
- sapphirina* Walker, 1862 : 9 (*Rutilia*). Holotype ♂, INDONESIA (Moluccas, Halmahera [as 'Gilolo'], *A. R. Wallace*) : BMNH, London.
- saturatissima* Walker, 1861b : 287 (*Rutilia*). Lectotype ♂, by present designation (p. 120), INDONESIA (Moluccas, Batjan, *A. R. Wallace*) : BMNH, London.
- savaiiensis* Malloch, 1935 : 350 (*Rutilia* (*Rutilia*)). Holotype ♂, SAMOA (Savaii Island, Fagamalo, xi.1925, *Buxton & Hopkins*) : BMNH, London.
- scutellata* Enderlein, 1936 : 405 (*Chrysorutilia*, as variety of *media* Macquart, 1846). Holotype ♀, AUSTRALIA (South Australia, Adelaide, *Schomburgk*) : MNHU, Berlin.
- semifulva* Bigot, 1880 : 89 (*Rutilia*). Lectotype ♂, by designation of Crosskey (1971 : 301), AUSTRALIA : BMNH, London.
- serena* Walker, 1849 : 865 (*Dexia*). Neotype ♀, by present designation (p. 123), INDIA (Maharashtra, Purandhar, near Poona, c. 3000 ft, on bush, *E. P. Sewell*) : BMNH, London.
- setosa* Macquart, 1847 : 94 (78) (*Rutilia*). Neotype ♂, by present designation (p. 126), AUSTRALIA (New South Wales, 4 m. N. of Bateman's Bay, 20.x.1953, *S. J. Paramonov*) : ANIC, Canberra.
- simplex* Malloch, 1936 : 17 (*Rutilia* (*Neorutilia*)). Holotype ♂, AUSTRALIA (Queensland, Eidsvold, xii.1922) : SPHTM, Sydney.
- smaragdifera* Bigot, 1874 : 462 (*Formosia*). Lectotype ♂, by designation of Crosskey (1971 : 298), INDONESIA (Moluccas, Batjan) : BMNH, London.
- smaragdina* Malloch, 1929 : 312 (*Formosia*). Holotype ♀, AUSTRALIA (N. Queensland, Gordonvale, 2.x.1917, *E. Jarvis*) : AM, Sydney.
- solomonicola* Baranov, 1936 : 101 (*Formosia*, as subspecies of *mirabilis* Guérin-Méneville, 1831). Lectotype ♂, by designation of Sabrosky & Crosskey (1969 : 44), SOLOMON ISLANDS (Guadalcanal, Kaukau [publ. as 'Kankau'], 21.viii.1934, *R. J. A. W. Lever*) : BMNH, London.
- soror* Brauer & Bergenstamm, 1891 : 418 (114) (*Rutilia*). *Nomen nudum* (no later validation).
- speciosa* Erichson, 1842 : 273 (*Rutilia*). Lectotype ♀, by present designation (p. 120), AUSTRALIA (Tasmania, *Schayer*) : MNHU, Berlin.
- spinipectus* Thomson, 1869 : 530 (*Rutilia*). Lectotype ♂, by present designation (p. 120), AUSTRALIA (New South Wales, Sydney, *Kimb.*) : NR, Stockholm.
- spinolae* Rondani, 1864 : 23 (*Rutilia*). Holotype or syntypes, sex unknown, AUSTRALIA : not located, probably lost.
- The introduction to the paper in which this name was published suggests that the type-material should be in Naples, but (in spite of careful search of museum collections at Naples and Portici recently made on request) it has not been located there or elsewhere in Italy. The original material is probably lost, and the name remains enigmatic.
- splendida* Donovan, 1805 : plate fig. (unnumbered) and description (unpaginated) (*Musca*). Neotype ♂, by present designation (p. 123), AUSTRALIA (Queensland, Brisbane, 8.ix.1907, *A. J. C. Wightman*) : BMNH, London.
- splendida* Townsend, 1927 : 282 (*Philippiformosia*). Holotype ♀, PHILIPPINE REPUBLIC (Nueva Viscaya, Imugin, *Baker*) : USNM, Washington D.C.
- This name is a junior secondary homonym in *Rutilia* of *R. splendida* (Donovan, 1805), see *townsendi* **nom. n.**
- stolida* Malloch, 1929 : 313 (*Chaetogastrina*). Holotype ♂, AUSTRALIA (New South Wales, Barrington Tops, 20.i.1927, *T. G. Campbell*) : AM, Sydney.
- subrustomentosa* Macquart, 1851 : 191 (218) (*Rutilia*). Holotype ♂, AUSTRALIA (Tasmania) : MNHN, Paris.
- subvittata* Malloch, 1929 : 295 (*Rutilia*, as variety of *formosa* Robineau-Desvoidy, 1830). Holotype ♂, AUSTRALIA (Western Australia, King George's Sound) : AM, Sydney.
- testacea* Macquart, 1843 : 278 (121) (*Diaphania*). Holotype or syntypes ♂, AUSTRALIA : MHN, Lille.

For further detail on original material in Macquart's collection in Lille see Crosskey (1971 : 267).

**townsendi** **nom. n.** for *Philippiformosia splendida* Townsend, 1927, junior secondary homonym preoccupied in *Rutilia* by *R. splendida* (Donovan, 1805). For type-data see under *splendida* Townsend above.

**transfuga** Bezzi, 1928 : 192 (*Rutilia*). Holotype ♀, FIJI (Viwa, 26.x.1921, *H. W. Simmonds*) : BMNH, London.

Bezzi, in the original publication, recorded the type-locality in Fiji as 'Suva', but this was clearly an error due to misreading of the handwritten word 'Viwa' given on the data label of the holotype. Viwa, a small island of the Fiji group lying north-west of Viti Levu, is the correct type-locality.

**transversa** Malloch, 1936 : 15 (*Rutilia*). Holotype ♂, AUSTRALIA (Western Australia, Swan River, *J. Clark*) : SPHTM, Sydney.

**trixoides** Walker, 1861b : 289 (*Rutilia*). Holotype ♀, INDONESIA (Moluccas, Batjan, *A. R. Wallace*) : BMNH, London.

**uzita** Walker, 1849 : 860 (*Dexia*). Holotype ♀, AUSTRALIA : BMNH, London.

The locality was cited in the original description as 'New Holland ?' but the specimen must without doubt have originated from Australia.

**valentina** Macquart, 1843 : 279 (122) (*Amphibolia*). Holotype or syntypes ♂, AUSTRALIA : MHN, Lille.

For further detail on original material in Macquart's collection in Lille see Crosskey (1971 : 263).

**variegata** Bigot, 1874 : 461 (*Formosia*). Lectotype ♀, by designation of Crosskey (1971 : 299), AUSTRALIA : BMNH, London.

**velutina** Bigot, 1874 : 463 (*Formosia*). Lectotype ♀, by designation of Crosskey (1971 : 299), AUSTRALIA (Tasmania) : BMNH, London.

**versicolor** Brauer & Bergenstamm, 1889 : 171 (103) (*Chrysopasta*). Lectotype ♂, by fixation of Malloch (1928b : 616), AUSTRALIA (Western Australia, Swan River) : NM, Vienna.

The type-material of this species consists of a ♂ and a ♀ specimen with the same type-data; Malloch (1928b : 616) referred to the male as 'type' and the female as 'allotype', and cited the type-data, and his action is here accepted as providing a valid lectotype fixation.

**victoriae** Malloch, 1936 : 13 (*Senostoma*). Holotype ♂, AUSTRALIA (Victoria, Gisborne, 19.iii.1922, *G. Lyell*) : SPHTM, Sydney.

**vidua** Guérin-Méneville, 1843 : 273 (*Rutilia*). Syntypes 1 ♂, 3 ♀, AUSTRALIA : lost.

**violacea** Macquart, 1851 : 198 (225) (*Chetogaster*). Holotype ♂, AUSTRALIA ('côte orientale', probably New South Wales) : MNHN, Paris.

**viridescens** Enderlein, 1936 : 424 (*Pancala*, as variety of *gemmata* Enderlein, 1936). Lectotype ♂, by present designation (p. 119), PAPUA NEW GUINEA (New Britain, Kinigunang, *C. Ribbe*) : MNHU, Berlin.

**viridescens** Enderlein, 1936 : 403 (*Chrysorutilia*, as variety of *caesia* Enderlein, 1936). Holotype ♀, AUSTRALIA (Queensland, *H. Peters*) : MNHU, Berlin.

**viridicingens** Enderlein, 1936 : 421 (*Hega*). Holotype ♂, INDONESIA (Moluccas, Batjan) : MNHU, Berlin.

**viridinigra** Macquart, 1846 : 307 (179) (*Rutilia*). Lectotype ♀, by designation of Crosskey (1971 : 290), AUSTRALIA (Tasmania) : MNHN, Paris.

**viridis** Malloch, 1936 : 19 (*Chaetogaster*). Holotype ♂, AUSTRALIA (New South Wales, Comboyne, *Chisholm*) : SPHTM, Sydney.

Malloch described this species from the male, as stated by him (Malloch, 1936 : 19, line 1) before the key but not in the description; the holotype is ♂, not ♀ as stated by Paramonov (1968 : 367).

**viriditestacea** Macquart, 1851 : 190 (217) (*Rutilia*). Lectotype ♂, by designation of Crosskey (1971 : 290), AUSTRALIA (Tasmania) : MNHN, Paris.

**viridithorax** Bigot, 1874 : 457 (*Formosia*). *Nomen nudum* (no later validation).

Bigot (*loc. cit.*) attributed the name *viridithorax* to Macquart with the citation '*Rutilia*



- id., Macq., Dipt. exot.', but the name was not published by Macquart and remains a *nomen nudum* attributable to Bigot.
- viridiventris** Crosskey, 1972 : (present paper) (*Formosia (Formosia)*). Holotype ♂, SOLOMON ISLANDS (Guadalcanal, Tapenanje, 10-30.ix.1953, *J. D. Bradley*) : BMNH, London.
- vittata** Macquart, 1855 : 126 (106) (*Rutilia*). Holotype ♀, AUSTRALIA (South Australia, Adelaide) : BMNH, London.
- vivipara** Fabricius, 1805 : 309 (*Tachina*). Neotype ♂, by present designation (p. 120), AUSTRALIA (New South Wales, Barrington Tops, 9.iv.1949, *S. J. Paramonov*) : ANIC, Canberra.
- volucelloides** Walker, 1861b : 289 (*Rutilia*). Lectotype ♂, by present designation (p. 120), INDONESIA (Moluccas, Batjan, *A. R. Wallace*) : BMNH, London.
- walkeri** Paramonov, 1968 : 400 (*Prodiaphania*). Holotype ♀, AUSTRALIA (Western Australia) : AMNH, New York.
- wilsoni** Paramonov, 1950 : 524 (*Amphibolia*). Holotype ♂, AUSTRALIA (Victoria, Warburton, 14.xii.1930, *F. E. Wilson*) : NMV, Melbourne (ex Wilson coll.).
- [*wilsoni* Paramonov, 1954 : 281 (*Chaetogaster*). Not Rutiliini as herein defined.]
- zabirna** Walker, 1849 : 863 (*Dexia*). Lectotype ♂, by present designation (p. 118), AUSTRALIA (Western Australia, Perth, *G. Clifton*) : BMNH, London.

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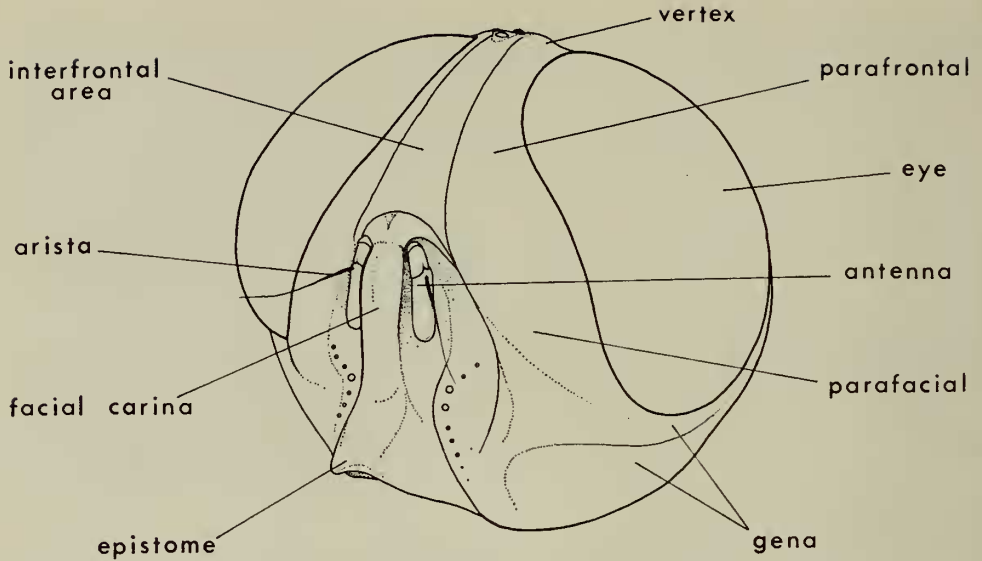
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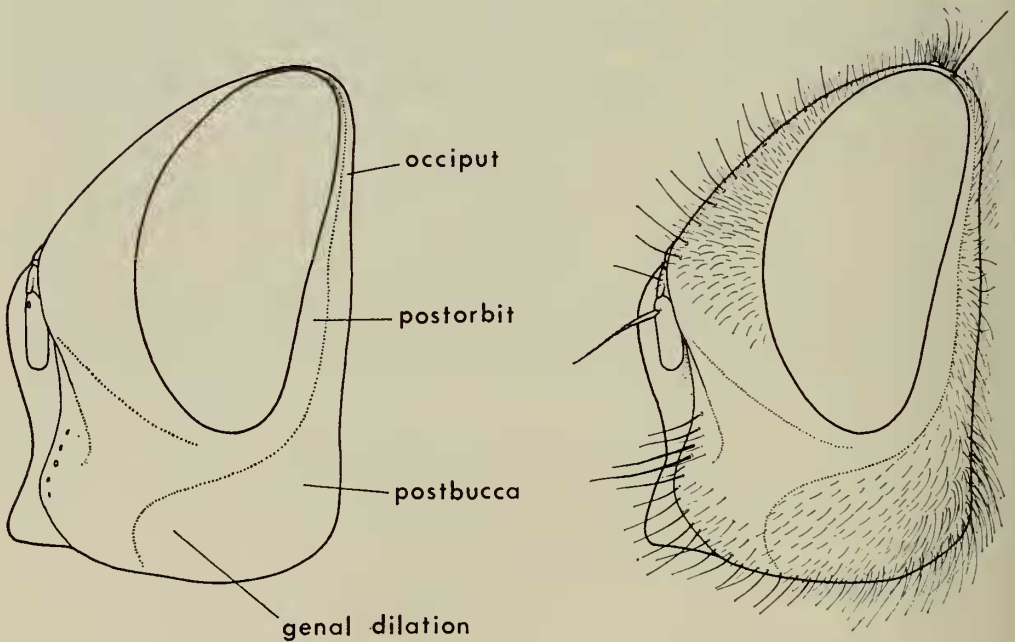
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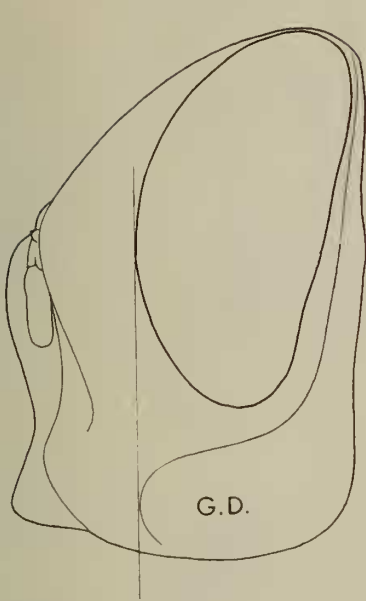
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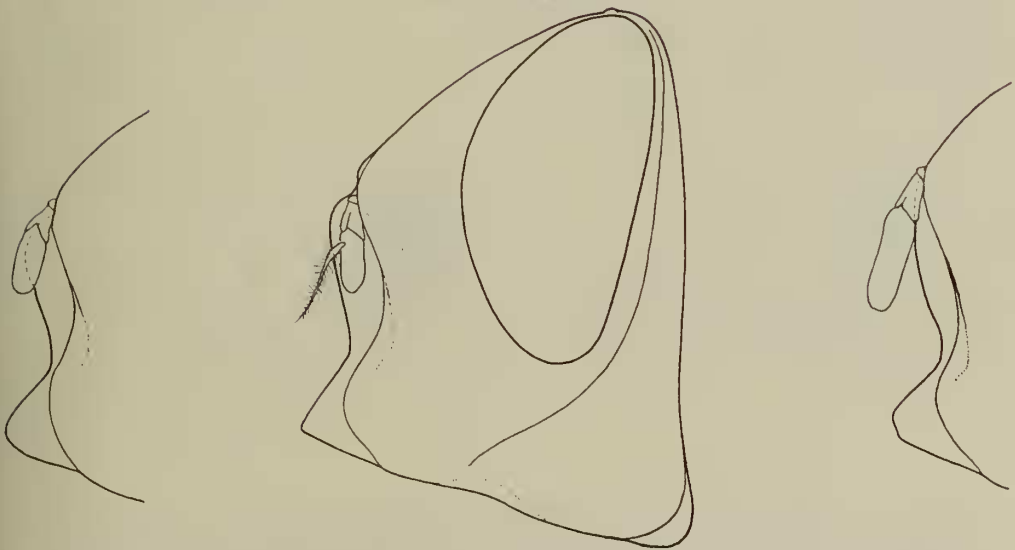
FIGS 1-3. Head of a Rutiline fly. 1 & 2, laterodorsal and profile views showing the terminology of main landmarks (vestiture omitted). 3, profile showing weak frontal bristling and vibrissae of typical forms.



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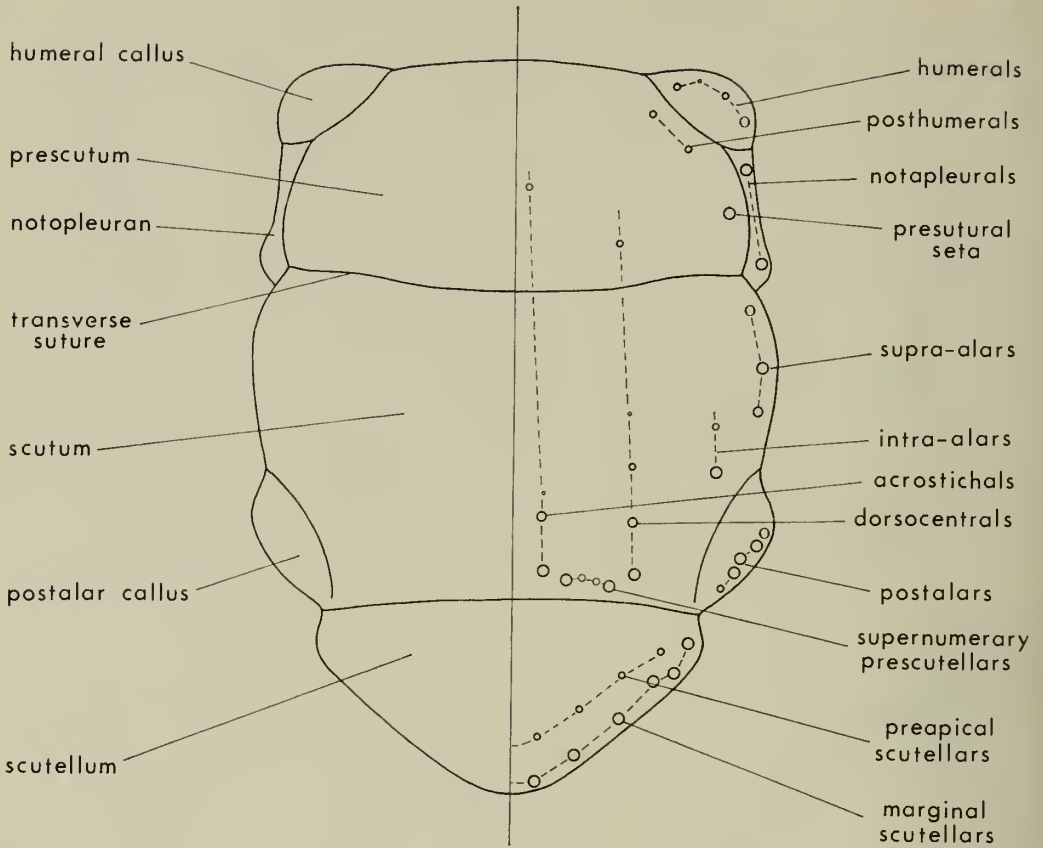
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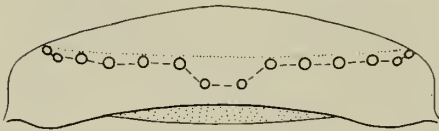
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FIGS 4-8. Head profile, in outline only, of: 4, *Rutilia*, showing genal dilation (G.D.) reaching to a level with anteriormost point of eye. 5, *Rutilodexia*, showing feeble genal dilation not reaching forwards nearly as far as anteriormost point of eye. 6, *Chrysopasta*, facial outline only. 7, *Prodiaphania*, showing strong development of gular region of head and short-plumose arista. 8, *Chetogaster*, facial outline only.

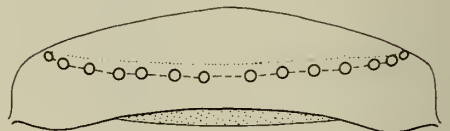




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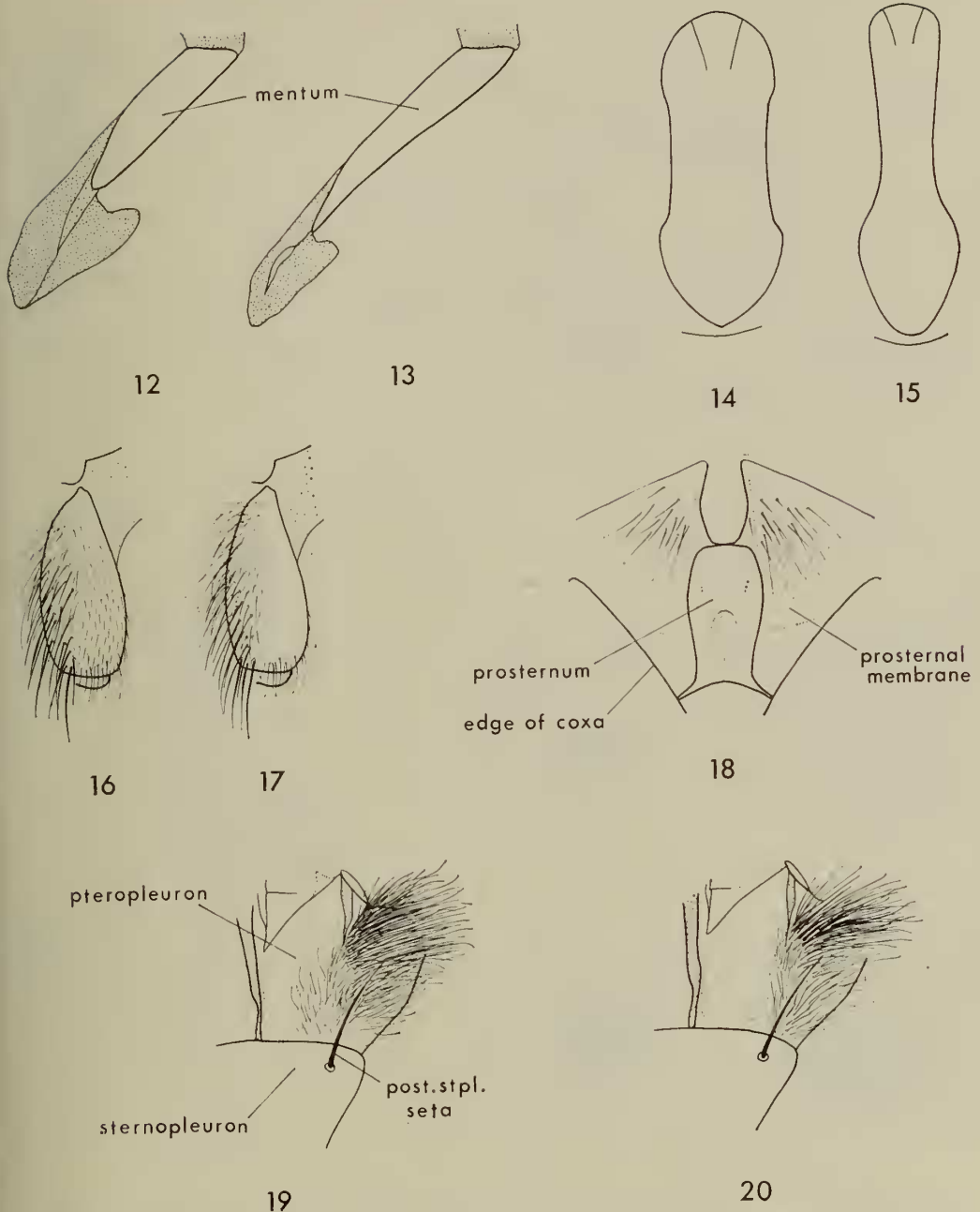


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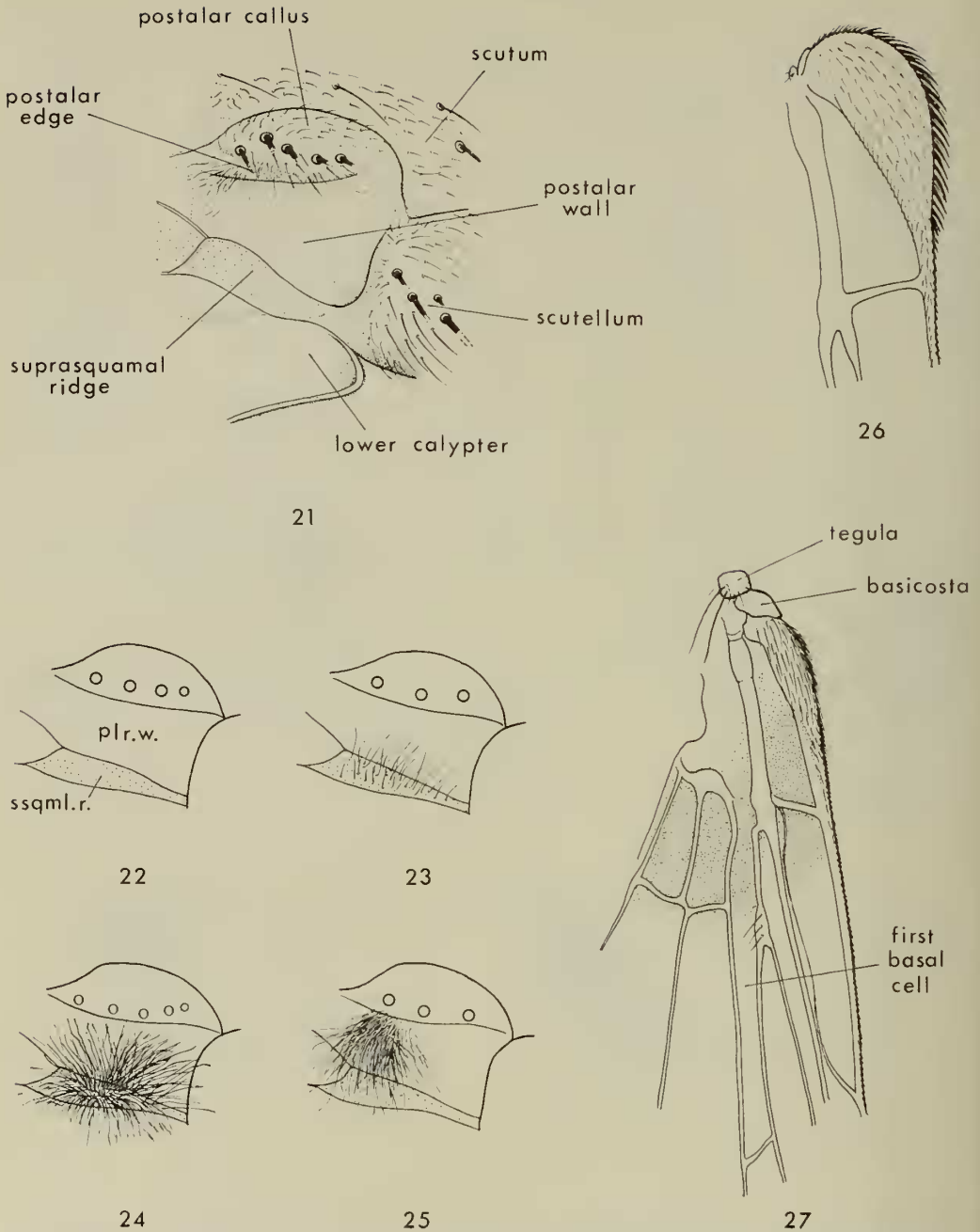


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FIGS 9-11. Thoracic dorsum of a Rutiline fly. 9, terminology of sclerites (left side of mid line) and chaetotaxy indicated by pores (right side of mid line). 10 & 11, posterior view of scutellum showing level of insertions of marginal scutellar setae in *Rutilia* (10) and *Formosia* (11). All figures schematic and relative bristle sizes indicated approximately by pore size shown (chaetotaxy very varied, forms may have more or fewer setae in any series than indicated or may lack some series completely: see discussion of taxonomic characters).

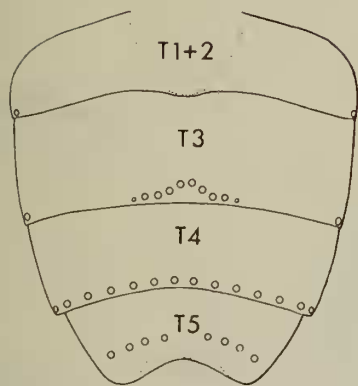


FIGS 12-20. Taxonomic characters used in the text. 12 & 13, two forms of proboscis found in Rutiliini: (12) mentum in profile with subparallel upper and lower edges, (13) mentum in profile distinctly tapering apically. 14 & 15, two forms of buccal opening (oral cavity) found in Rutiliini: (14) short broad buccal opening of most forms, (15) long narrow buccal opening of *Prodiaphania* and *Formodexia* (both drawn from females: buccal opening of males relatively slightly narrower in both types). 16 & 17, vestiture of inner anterior surface of fore coxa in (16) *Formosia* s. str. (almost whole surface haired) and in (17) other Rutiliini (bare on inner part). 18, hairing of prosternal membrane found in many forms. 19 & 20, extent of hairing on pteropleuron in (19) subgenera *Chrysorutilia* and *Ameniamima*, and (20) in other Rutiliini (hairing of sternopleuron omitted).

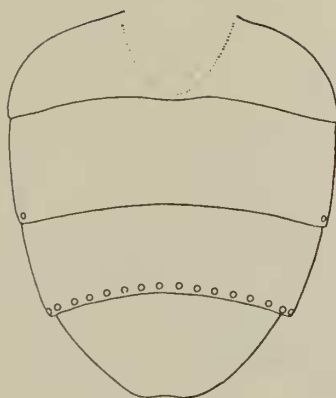


FIGS 21-27. Taxonomic characters used in the text. 21, postalar callus and surrounding structures. 22-25, vestiture of postalar wall and suprasquamal ridge in: 22, forms with both areas bare (e.g. *Prodiaphania*, *Rutilodexia*); 23, forms with sparse hairing only on suprasquamal ridge (e.g. subg. *Microrutilia*); 24, forms with very long dense hair on suprasquamal ridge (e.g. subg. *Chrysorutilia*, *Amphibolia*); 25, forms with dense hair tuft on postalar wall (*Formosia*, *Formodexia*). 26, strongly explanate costal base (e.g. *Prodiaphania*). 27, basal part of wing, showing long wiry setulae on tegula in most forms (shaded area indicates the sub-basal dark mark found on the wing of most Rutiliini).

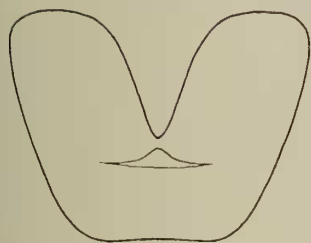




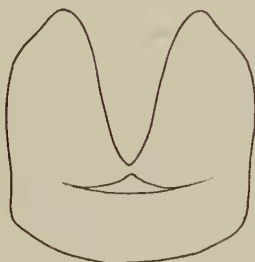
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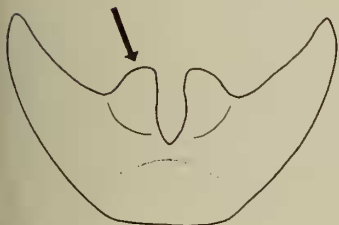
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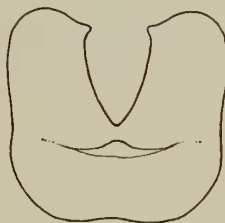
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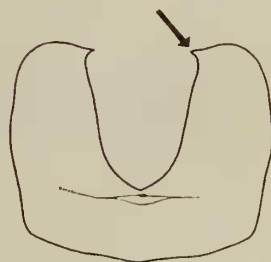
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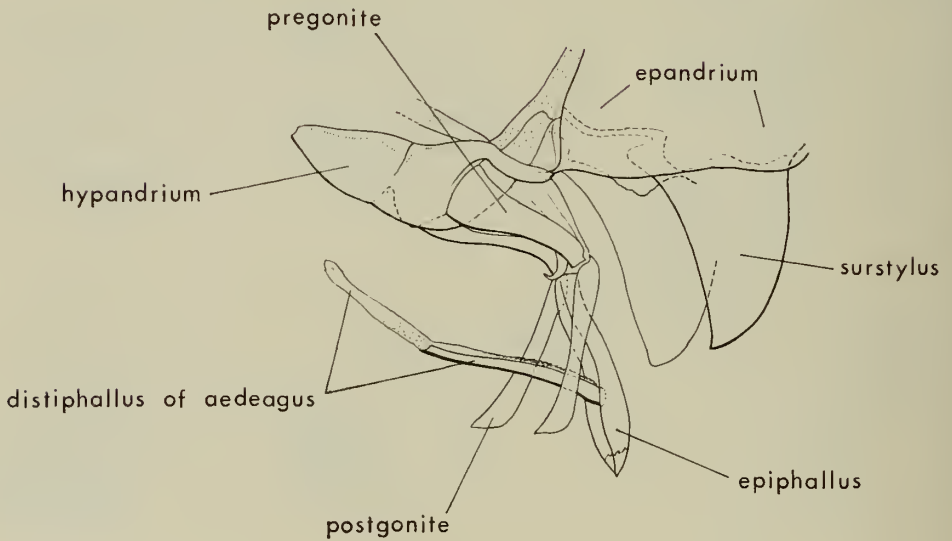
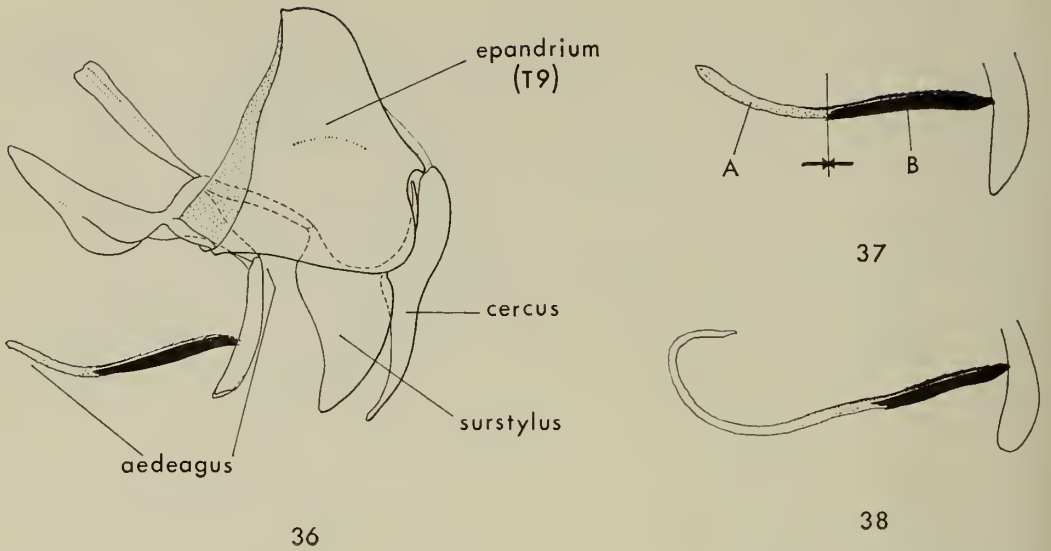


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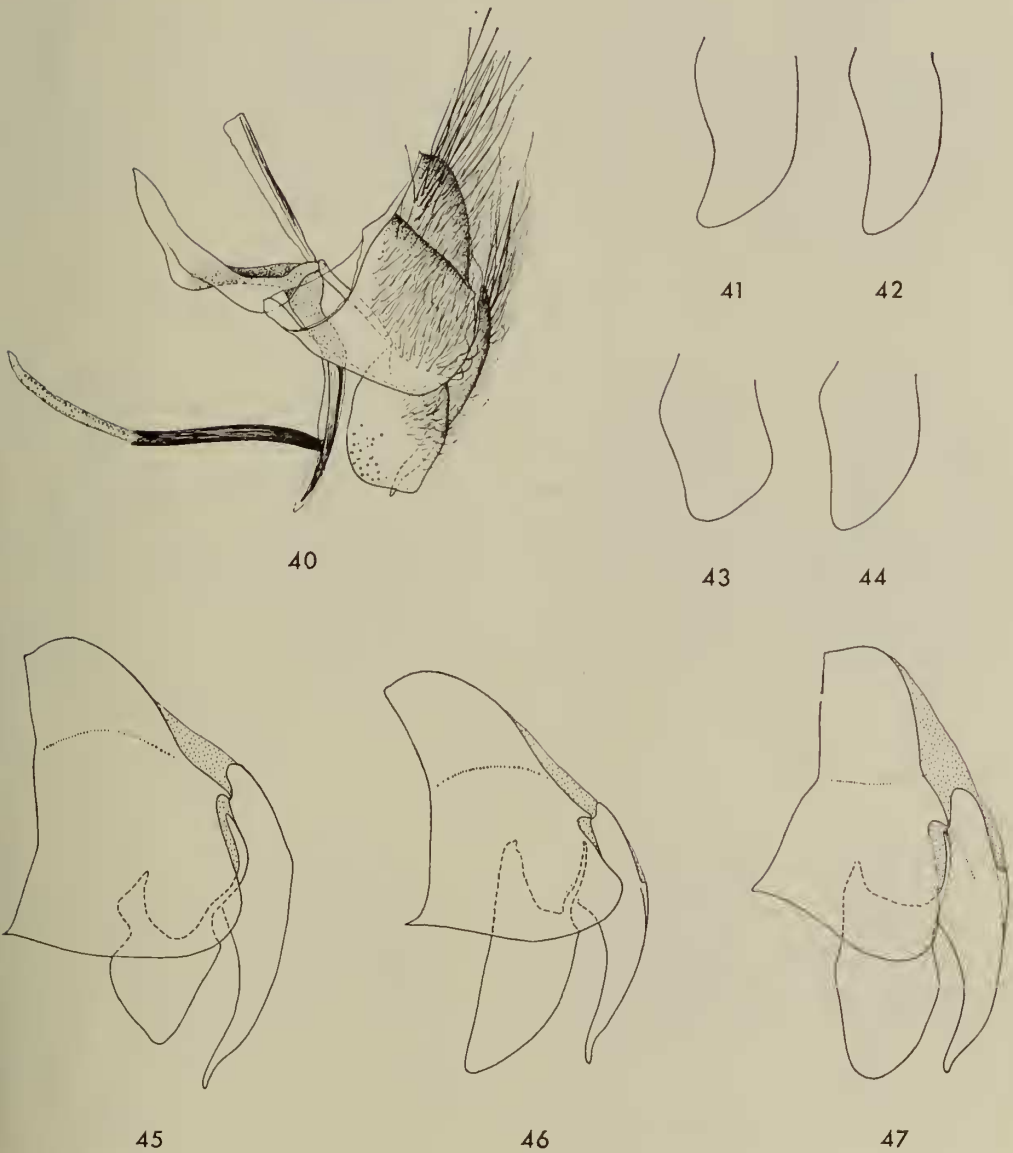
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FIGS 28-35. Abdominal characters. 28 & 29, the two main forms of abdomen in Rutiliini with tergite numbering (pores indicate a typical chaetotaxy associated with each abdominal shape). 30-35, fifth abdominal sternite of ♂ in: 30 & 31, great majority of forms; 32, subgenus *Microrutilia*; 33, subgenus *Grapholostylum*; 34 and 35, the two species of subgenus *Paramphibolia* (34, *stolida*; 35, *assimilis*). Hairing omitted.



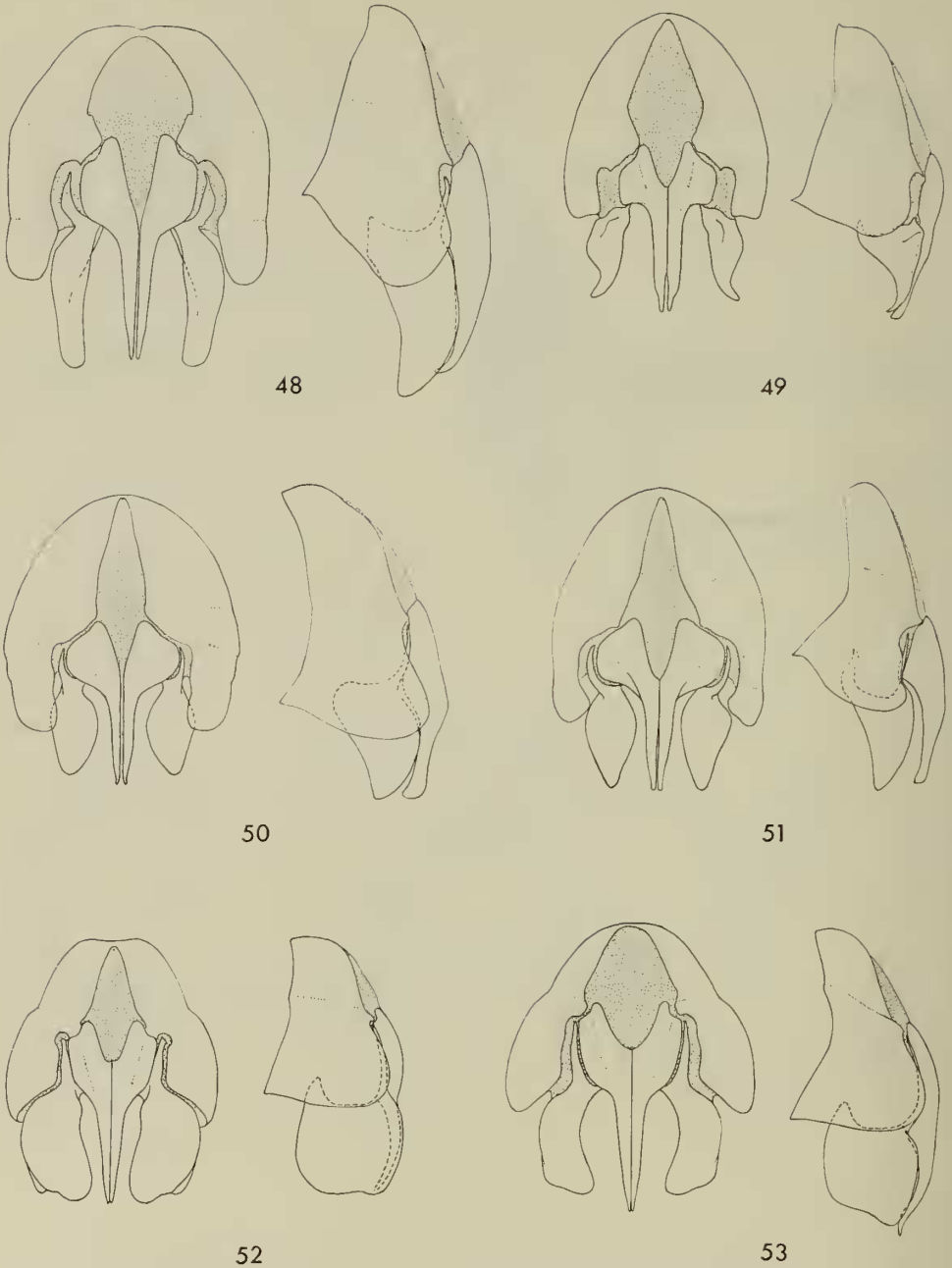
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FIGS 36-39. Male genitalia of Rutiliini. 36, whole hypopygium in profile. 37 & 38, two forms of aedeagal distiphallus found in Rutiliini: (37) great majority of forms in which apical membranous part (A) is subequal in length to or shorter than basal sclerotized part (B), (38) form in subgenus *Grapholostylum* in which membranous apical part whip-like and nearly twice as long as sclerotized basal part. 39, aedeagus and associated structures viewed obliquely. All hairing omitted.

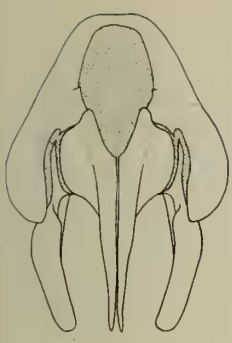


FIGS 40-47 Male genitalia in *Formosia* and *Chetogaster*. 40, complete hypopygium in profile of *Formosia fusca* sp. n. 41-44, range of shape in profile of the surstylus in *Formosia* s. str. 45-47, epandrium, cerci and surstyli in profile (hairing omitted) of *Chetogaster canberrae* (45), *C. oblonga* (46) and *C. violacea* (47).

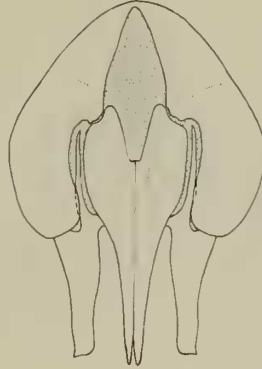
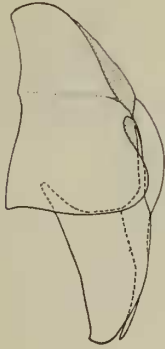




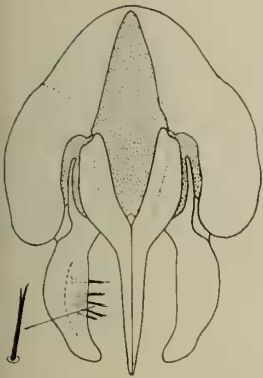
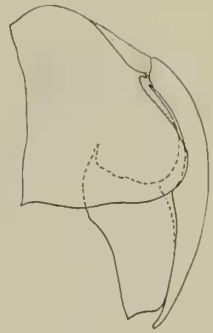
FIGS 48-53. Epandrium, cerci and surstyli of ♂ genitalia in *Formosia* s. l. Apical view (left) and profile (right). 48, *F. (F.) flavipennis*. 49, *F. (F.) viridiventris* sp. n. 50, *F. (Pseudoformosia) saturatissima*. 51, *F. (P.) excelsa*. 52, *F. (Euamphibolia) speciosa*. 53, *F. (E.) faceta*. Hairing omitted.



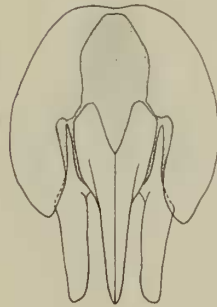
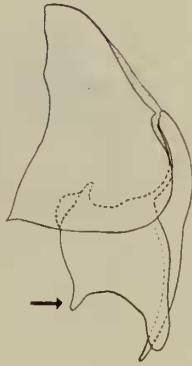
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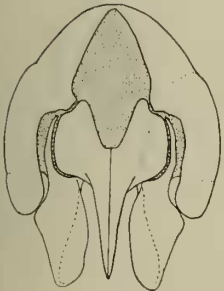
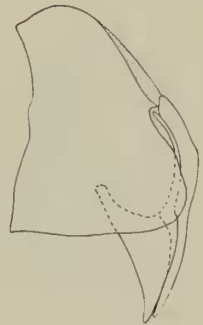
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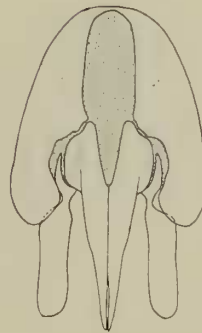
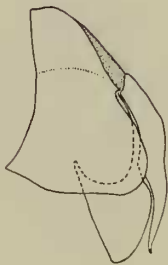
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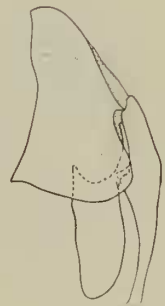
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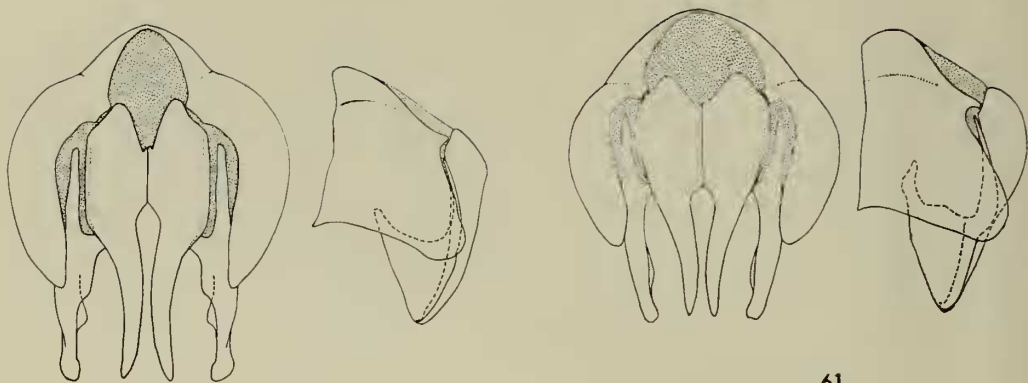
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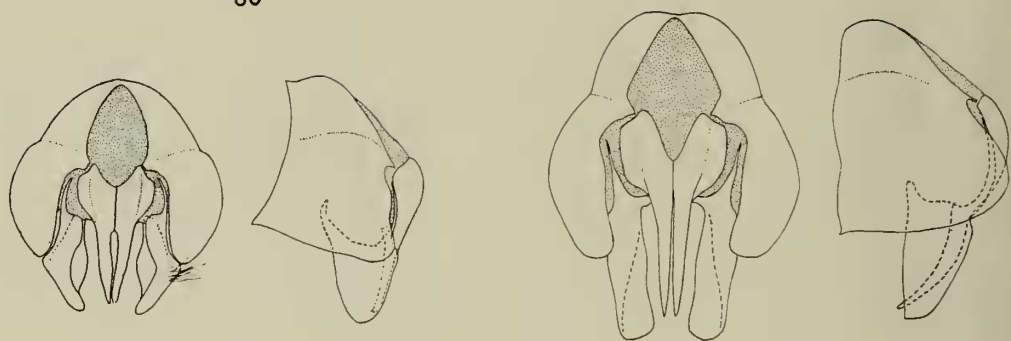


FIGS 54-59. Epandrium, cerci and surstyli of ♂ genitalia in *Rutilia* s. l. Apical view (left) and profile (right). 54, *R. (R.) vivipara*. 55, *R. (R.) confusa*. 56, *R. (R.) dentata* sp. n. 57, *R. (R.) setosa*. 58, *R. (Ameniamima) argentifera*. 59, *R. (Neorutilia) simplex*. Hairing omitted.



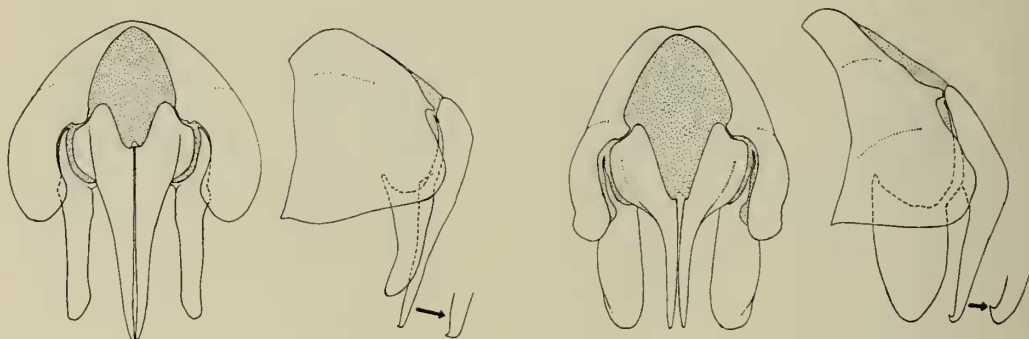
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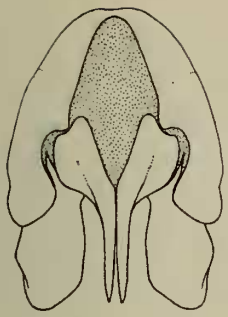


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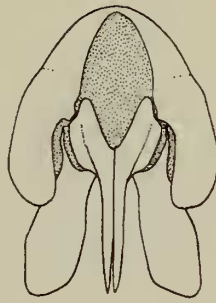
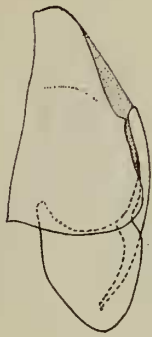
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FIGS 60-65. Epandrium, cerci and surstyli of ♂ genitalia in *Rutilia* s. l. Apical view (left) and profile (right). 60, *R. (Microrutilia) media*. 61, *R. (M.) nigripes*. 62, *R. (M.) minor*. 63, *R. (M.) hirticeps*. 64, *R. (Grapholostylum) dorsomaculata*. 65, *R. (Donovanius) agalmiodes*. Hairing omitted, except for tuft on surstylus of *minor*.

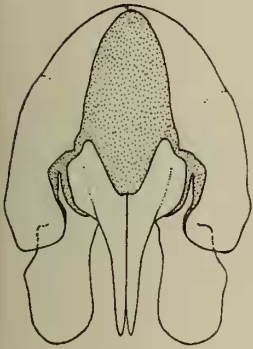
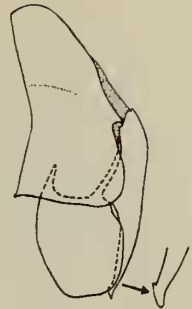




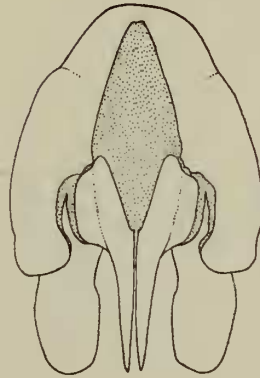
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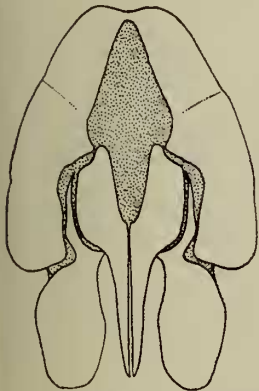
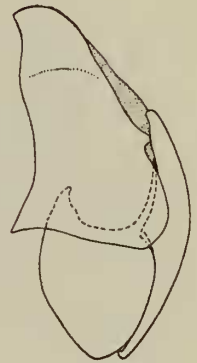
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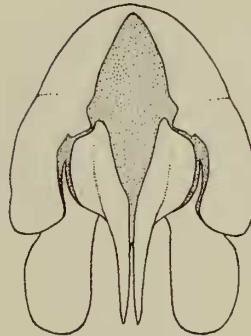
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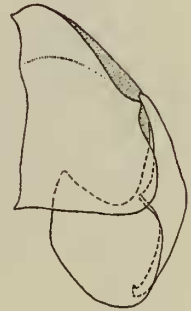
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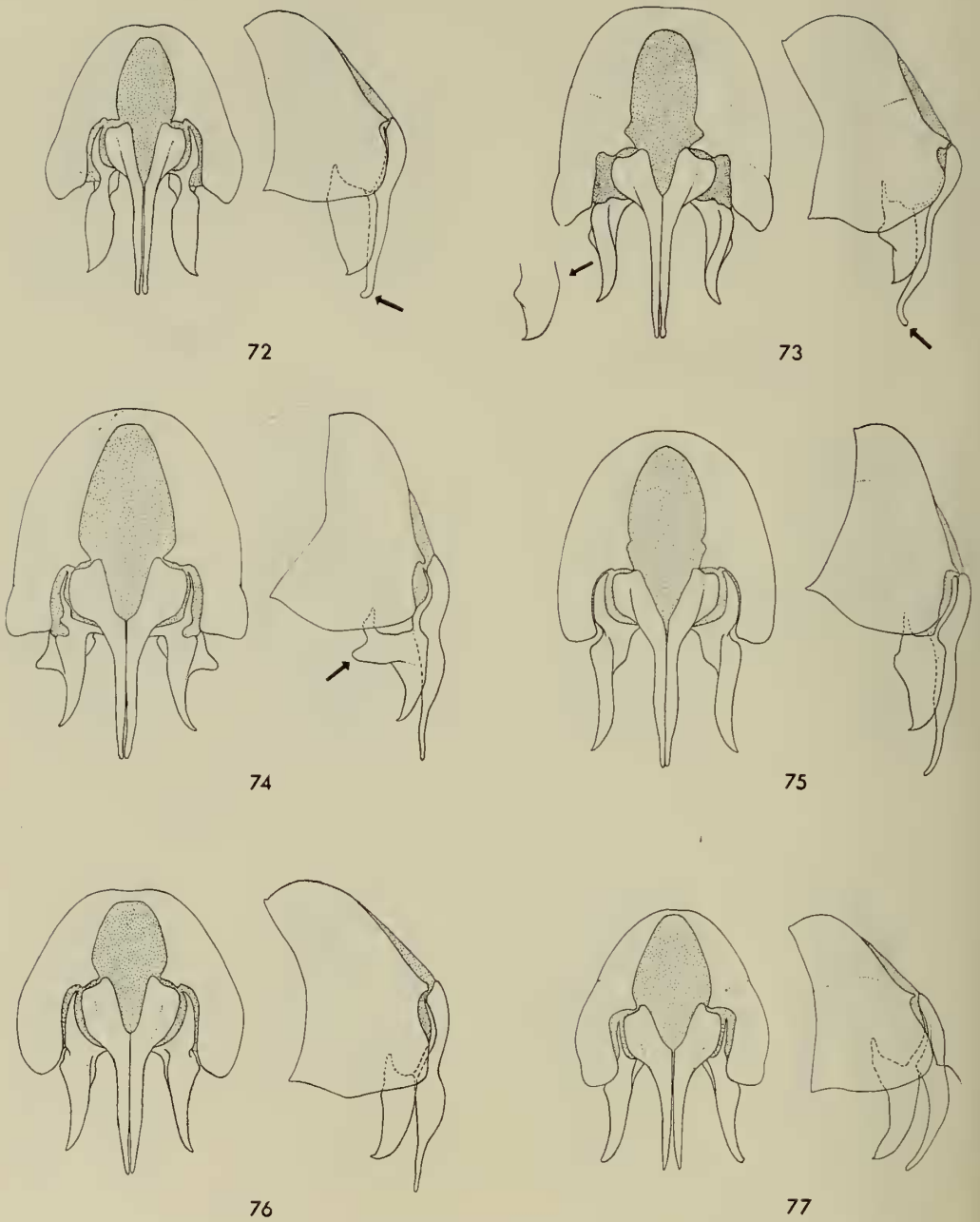
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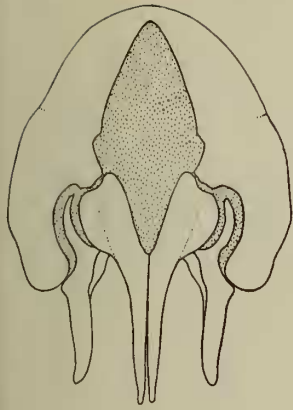
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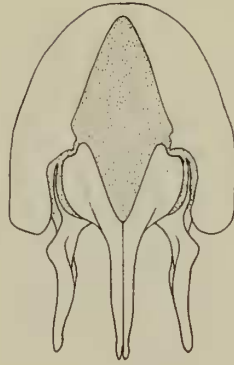
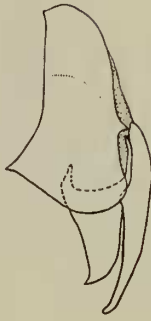
FIGS 66-71. Epandrium, cerci and surstyli of ♂ genitalia in subgenus *Donovanius*. Apical view (left) and profile (right). 66, *R. (D.) pellucens*. 67, *R. (D.) analoga*. 68, *R. (D.) sabrata*. 69, *R. (D.) inusta*. 70, *R. (D.) regalis*. 71, *R. (D.) lepida*. Hairing omitted.



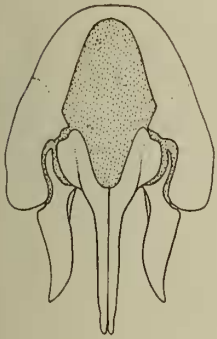
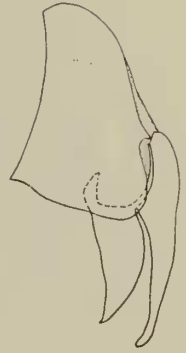
FIGS 72-77. Epandrium, cerci and surstyli of ♂ genitalia in subgenus *Chrysorutilia*. Apical view (left) and profile (right). 72, *R. (C.) splendida*. 73, *R. (C.) decora*. 74, *R. (C.) cryptica* sp. n. 75, *R. (C.) imperialis*. 76, *R. (C.) imperialoides* sp. n. 77, *R. (C.) idesa*. Hairing omitted.



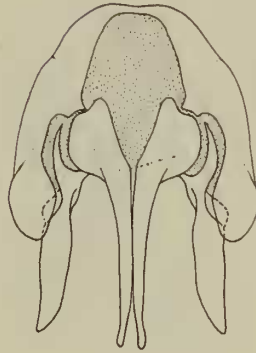
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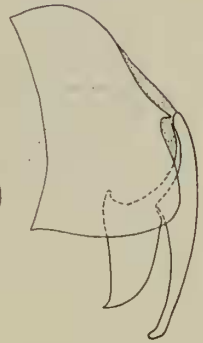
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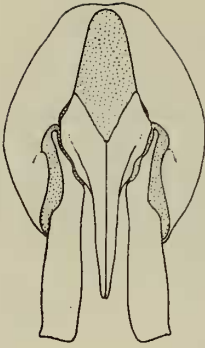
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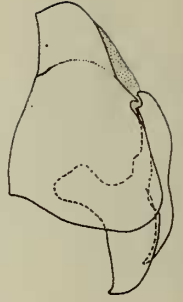
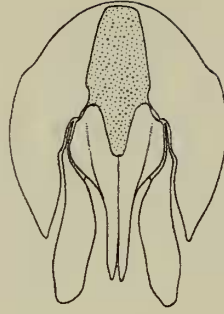
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FIGS 78-84. Epandrium, cerci and surstyli of ♂ genitalia in subgenus *Chrysorutilia*. Apical view (left) and profile (right), and profile shape of surstylus only for some species. 78, *R. (C.) rubriceps*. 79, *R. (C.) caeruleata*. 80, *R. (C.) panthea*. 81, *R. (C.) formosa*. 82, *R. (C.) transversa*, profile of surstylus. 83, *R. (C.) caesia*, profile of surstylus. 84, *R. (C.) chersipho*, profile of surstylus. Hairing omitted.

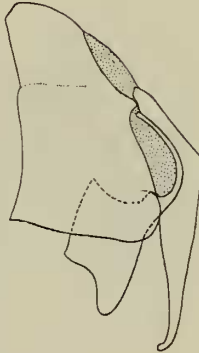
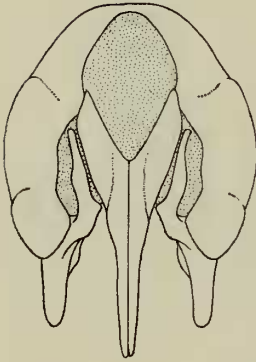




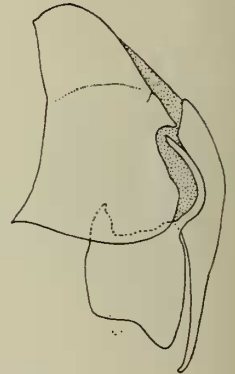
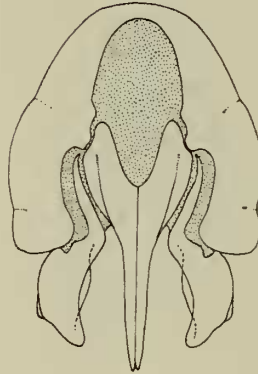
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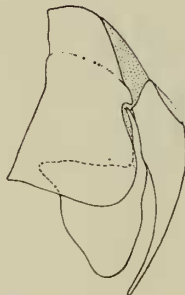
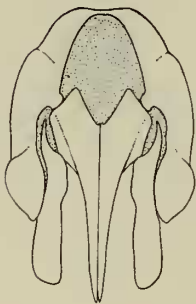
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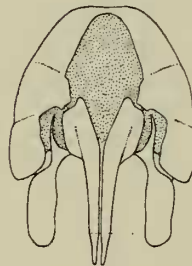
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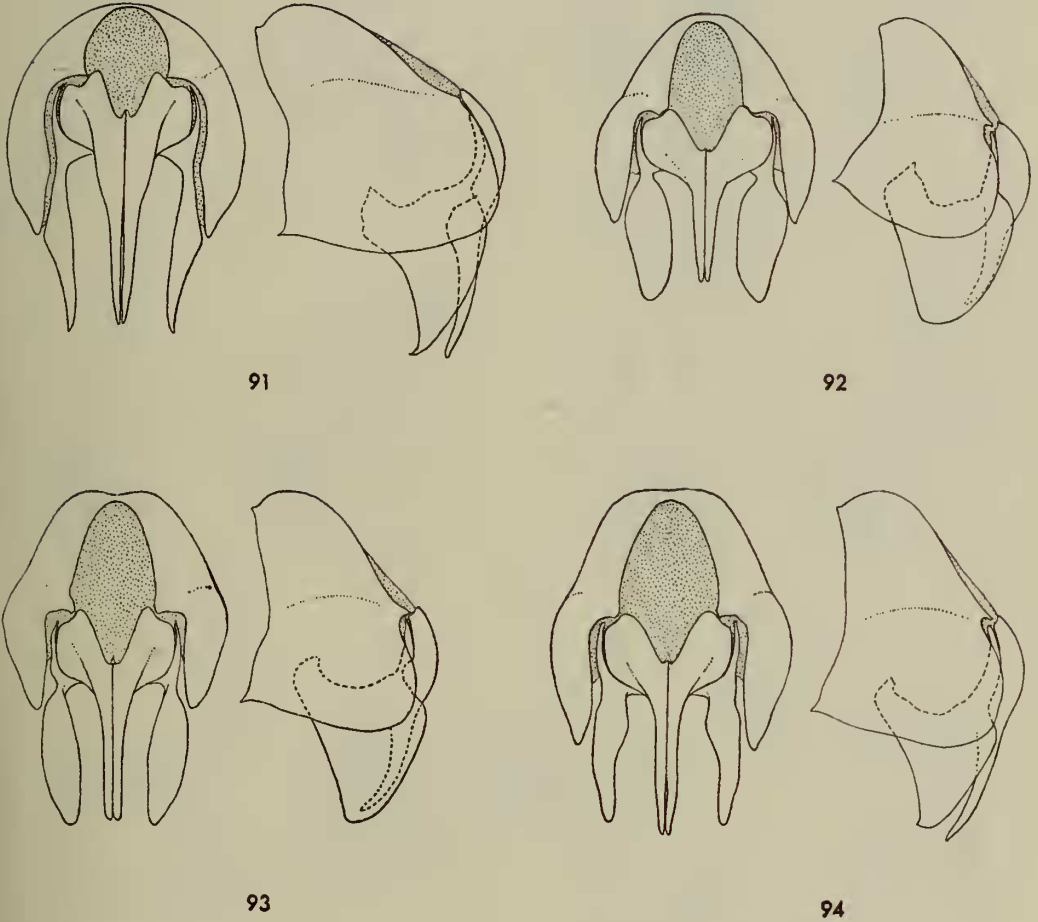


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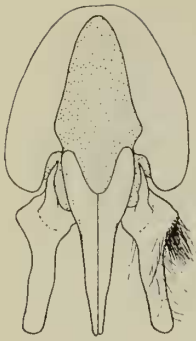


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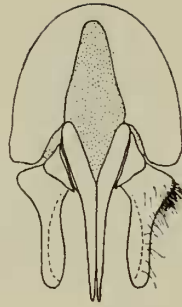
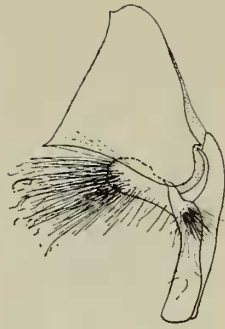
FIGS 85-90. Epandrium, cerci and surstyli of ♂ genitalia in *Amphibolia* and *Rutilodexia*. Apical view (left) and profile (right). 85, *A. (Paramphibolia) assimilis*. 86, *A. (P.) stolidia*. 87, *A. (Amphibolia) ignorata*. 88, *A. (A.) valentina*. 89, *A. (A.) campbelli*. 90, *Rutilodexia ? papua*. Hairing omitted.



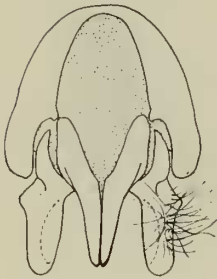
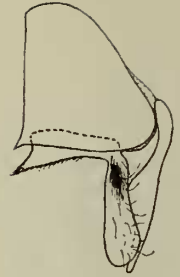
FIGS 91-94. Epandrium, cerci and surstyli of ♂ genitalia in the genus *Chrysopasta*. Apical view (left) and profile (right). 91, specimen from Newdegate, W.A. 92, specimen from 6 miles north of Watheroo, W.A. 93, holotype of *elegans* Macquart, locality unknown. 94, lectotype of *zabirna* Walker, Perth, W.A. (See text for discussion of variability.) Hairing omitted.



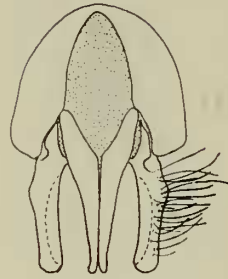
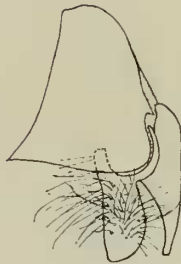
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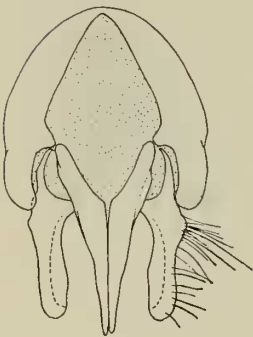
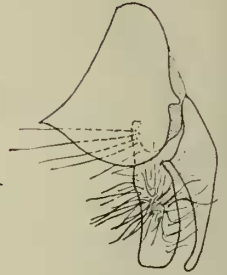
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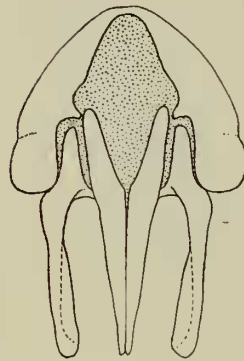
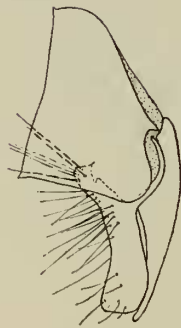
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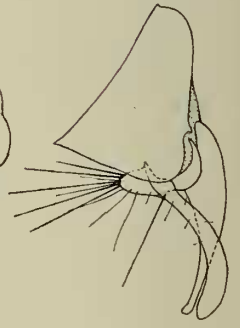
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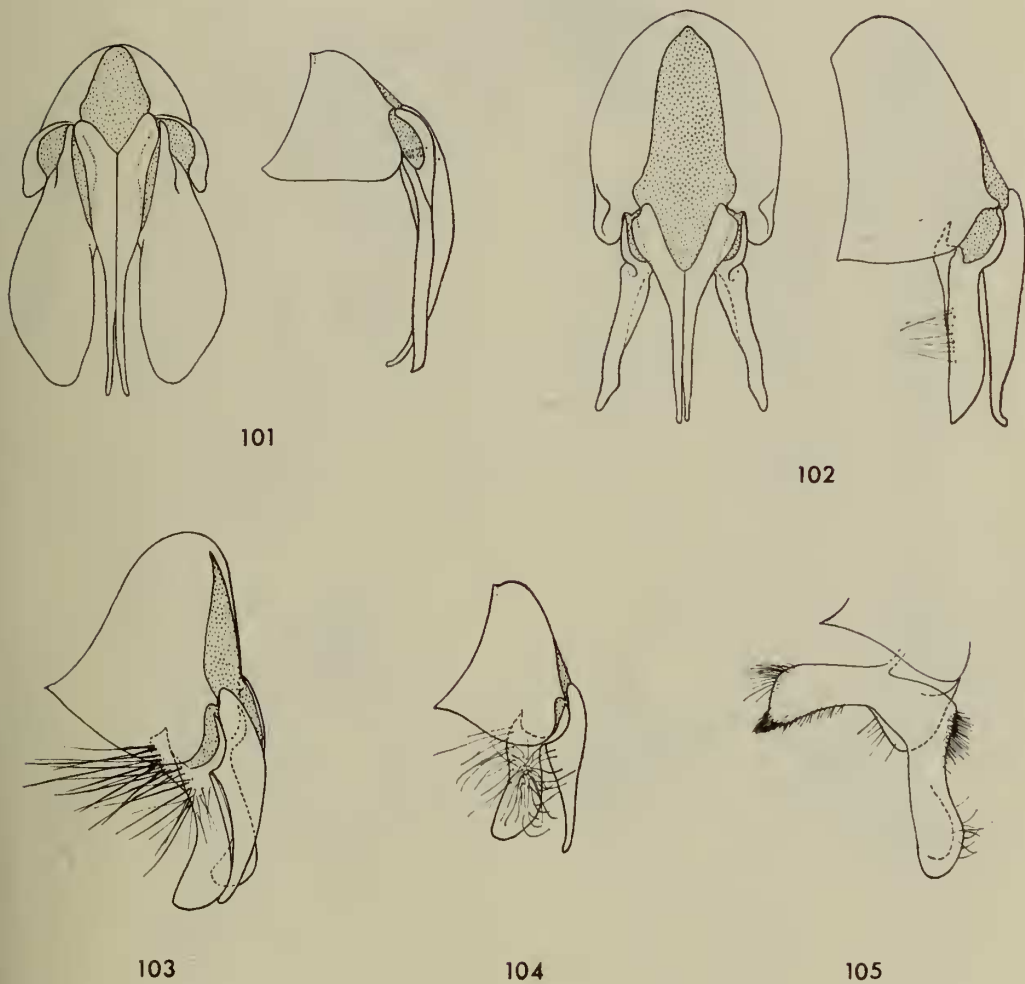


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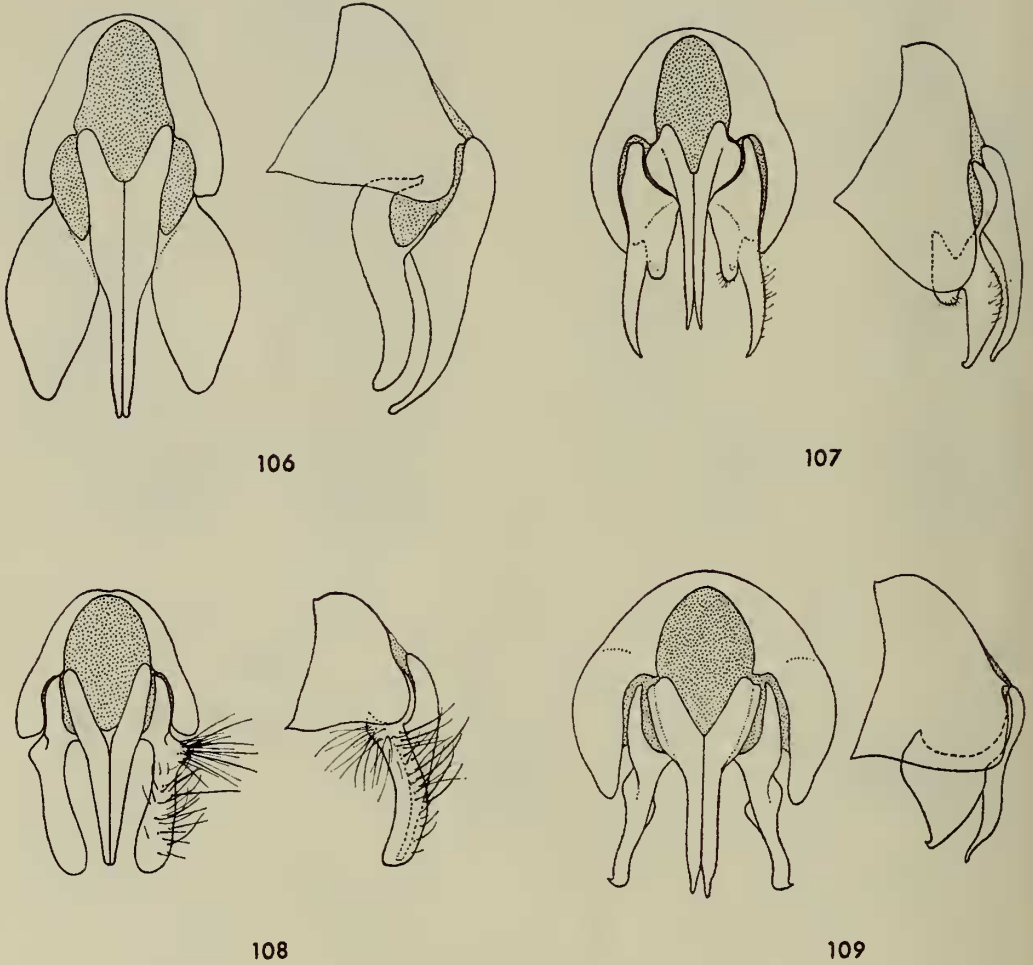


FIGS 95-100. Epandrium, cerci and surstyli of ♂ genitalia in *Prodiaphania*. Apical view (left) and profile (right). 95, *P. testacea*. 96, *P. furcata*. 97, *P. minuta*. 98, *P. arida*. 99, *P. fullerae*. 100, *P. genitalis*. Main hairing only shown.





FIGS 101-105. Epandrium, cerci and surstyli of ♂ genitalia in *Prodiaphania*. 101, *P. georgei*, apical view and profile. 102, *P. victoriae*, apical view and profile. 103, *P. funebris*, semi-profile (drawn from old slide mount of ♂ genitalia of paratype specimen in which hypopygium not mounted exactly in profile). 104, *P. deserta*, profile. 105, *P. furcata*, surstylus only in profile.



FIGS 106-109. Epandrium, cerci and surstyli of ♂ genitalia in *Prodiaphania* and *Rutilia*. Apical view (left) and profile (right). 106, *P. biarmata*. 107, *P. cygnus*. 108, *P. regina*. 109, *Rutilia (Microrutilia) nigriceps*.



MAP. Geographical distribution of the tribe Rutiliini. Known distribution solid black, suspected distribution stippled. Samoa represents the furthest eastwards extent of the tribal range.

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